AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Published by Howes Publishing Company, 90 William Street, New York

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

Volume XVIII NEW YORK, MAY 13, 1929 Number 8

The Desizing of Cotton and Rayon Piece Goods

Value of the Enzymes—Preparation for Singeing—Conserving Caustic—Importance of Control

By THOMAS F. HUGHES

THE industrial development of to-day, as a result of keen competition, has brought the working conditions in many plants to a high point of efficiency. The constant endeavor has been to obtain maximum production at the lowest cost.

It has always been the aim of the bleacher to get out his goods in one nine-hour boil, and this can be carried on successfully if the goods are properly desized. Care should be taken in this operation, and the temperature kept at a given point. If the temperature is too high or too low, no action takes place. Desizing in the proper manner has been taken up with more interest during the past few years as it has been proved that goods properly desized and given a caustic kier boil are left in a clear state so that there is no further trouble throughout the process, producing a pure absorbent white that is always free from resist, a white that will stay white and not turn yellow on the shelves or in the cases.

The writer has had considerable experience in the desizing of cotton piece goods and rayon, and has found that the quickest and most economical materials to use for this purpose are enzymes such as are now put out in dry concentrated powder form. I have used such products in several plants at the rate of 3¼ ounces to 100 gallons of water, with the addition of 5 pounds of salt. The enzyme is dissolved in a wooden pail, with lukewarm water, and added to a tank containing 100 gallons of water at a temperature of 135° F. Inasmuch as it has an effective strength of eighty times the liquid products, a stock solution can be made up by dissolving one pound in 80 pounds of water, using from this, pound for pound, in the same quantities, as may be customary with desizing liquids. It is well not to let the temperature get below 130° F. or over 145° F., as temperatures above this point begin to impair all enzymes.

The liquor is now run into your singebox which should have a small steam coil at the bottom to keep the liquor at the right temperature at all times. Before placing the dissolved enzymes in the 100 gallons of water, add 5 pounds of salt and dissolve. The goods are now ready for singeing and pass through the liquor into boxes or bins.

If in boxes, it is well for quick result to cover the boxes with burlap and let stand one hour, when they are washed in an open soaper containing three wash boxes and three nips of rubber squeeze rolls. In the first box is warm water where the goods enter up and down over rolls, then through the nip into the next box containing an emulsion made of 5 pounds of soda ash and two quarts of tetrakierol, a sulphonated oil containing verapol, a bleaching agent. From this box the cloth goes to the last box and final wash where the goods are washed in water nearly to the boiling point. They are then mangled and sent to the drying cans to be dried, after which they are ready for dyeing any dark shade, and this works out exceptionally well for sulphur colors.

Goods that are desized for bleaching may be carried on the same way and may be left in the singe bins or boxes overnight without any harm. All goods should be given a good wash before putting into the kier so that the soluble starches and sugars converted by the enzymes from the starch may be removed, as well as other soluble materials in the size.

The sizing compounds which are applied to warps consist of starches, glues and gums, and in addition they nearly always contain some fatty matter to make the warp more pliable, and all this is readily removed by the use of this enzyme, which contains proteolytic properties in addition to its starch liquifying powers. The effective value of the enzyme does not deteriorate with use, therefore a standing bath may be brought up to volume by the addition of more liquor and salt as stated above.

Quick action can be gained by the desizing of yarn in the kiers. This is done by filling the kier with bundles

of yarn, then filling the kier with water, adding the desizing agent. Dissolve one pound in lukewarm water with 15 pounds of salt added, then start the kier circulating and bring to a temperature of 135° F. Let kier run for a half hour, wash down with warm water and proceed to boil as usual. This puts the yarn in a clean condition before boiling and gives it the nice soft feel which is so highly desired, because it will give even dyeing and render the yarn more absorbent for mercerizing, thus obtaining a high luster.

The desizing of rayon and colored yarn goods can be carried on the same way at the singer. In the desizing of yarn that is not to be bleached and is to go for dark shades, this desizing agent will give quick action in a Klauder Weldon or similar machine, where the yarn may be desized, washed and dyed or bleached without removing from the machine. The same process can also be carried out in the dyehouse in tubs with the yarn hung on poles.

Conserving Caustic

Mercerizing piece goods from grays that have been desized and given a good wash produces as high a luster as if the goods were boiled, and when this is done a centrifugal pump is placed on the side of the mercerizer pad so that if the caustic should get below 54° Tw. in the mercerizing bath, the caustic can be pumped back to the storage tank and fresh caustic run in. This pump is also a great help in pumping out the caustic should a roll break or anything go wrong in the caustic pad box; otherwise this large amount of caustic would go to waste in emptying the pad caustic box. The concentrated enzyme as used to-day is as much an improvement in the efficiency of the desizing operation as caustic was several years ago in replacing the old style lime foil, where all goods were given two boils, causing great shrinkage and loss in yardage.

Cotton piece goods that have been starched too heavy or too light may be easily stripped for restarching by use of a concentrated enzyme such as Polyzime P. This can be carried on in the starch mangle by putting this enzyme in the starch box and running the goods through, covering up and leaving overnight. Next morning wash, dry, and restarch for the proper feel. I have found that a dry concentrated enzyme as described has marked advantages over the older liquid materials, and not only increases the speed in the desizing action, but also functions in the processing of cotton piece goods in the kier boil, as the old way of giving the goods two boils is done away with, thus shortening the process and saving time and labor. It is in the kier that the main process essential to the production of white goods is performed, and this work cannot be carried out unless the goods have been properly desized. The process depends for its effects on the fact that pure cellulose is much more resistant to the action of hot, weak alkalies than most of the accompanying materials.

In addition, advantage is taken of the fact that under the conditions in the kier the few materials that are not dissolved by the caustic soda are emulsified by the action of this material and that of the soaps which have been formed. Since this enzyme removes all traces of size, it can be readily seen that the caustic soda used in the kiers can be cut down, and this will prove of value in considering precautions to prevent damage to the goods. While cellulose, the basic material of cotton, is comparatively resistant to the action of the chemicals used in boiling and souring, it is not absolutely so.

There remains always to be borne in mind the possibility that some damage may be done to the goods if the process is too strenuous, or not well regulated. In the presence of alkalies, cellulose is oxidized to a material known as oxycellulose. This material is white like cotton but has no strength, and has a great tendency to yellow with age. Acids, if allowed to become too strong, will form hydrocellulose, which is also lacking in strength and yellows readily. No matter what modifications may be made in practice, the underlying principles are as outlined above, and it may be stated that goods properly treated with this enzyme save time and trouble for the bleacher, mercerizer, dyer and finisher.

NEW CIBA DYE FOR ACETATE RAYON

Production of a new violet for acetate rayon and two shades of direct pink has been announced by the Society of Chemical Industry of Basle. The colors are described in a circular and a shade card issued by the Ciba Company, Inc., of New York. The new rayon color is Cibacet Violet B Paste and Powder. It dyes acetate rayon a clear violet shade that is described as of excellent fastness to light. Its wash and water fastness is said to be very good, as well as its acid and perspiration fastness. Cotton effects in mixtures remain pure white, according to the description, while wool and silk do not remain very reserved. A boil-off with hydrosulphite is consequently recommended.

The two new shades of pink developed and placed on the market by the Society of Chemical Industry are known as Direct Brilliant Pink B and Direct Brilliant Pink 3B. They are described in the sample card as distinguished for purity of color and fastness. Cotton and viscose are colored in the alkaline Glauber salt bath, semi-silk in the neutral, or for brand B in the Glauber salt bath combined with acetic acid. The sample card shows extracts on cotton and viscose yarns, cotton piece goods, mixed weaves and prints on cotton pieces.

Batson, Cook Company, of Westpoint, Ga., was awarded contract for a five-story warehouse to be built for the Lanett Bleachery & Dye Works at Westpoint. The warehouse will be 60 by 125 feet in dimension.

A small addition will also be built to the boiler house. Plans were drawn and the contract let from the office of J. E. Sirrine & Co.

HOW THE NEW TARIFF AFFECTS DYES AND CHEMICALS

Rates in Coal-Tar Clauses Unchanged — American Valuation Retained—"Flexible" Clause Now Applies

WHILE the protection of a higher rate of duty requested by the dye and chemical industry is not provided in the Hawley-Smoot Tariff Bill introduced into the House of Representatives last week, yet certain features of the bill are sure to please most of the manufacturers—provided those features are retained during the bill's passage through House and Senate, in what promises to be a very heated tariff session.

The new bill has been designed, according to its framers, to provide a readjustment of the tariff rather than a revision. It was presented to the house on May 7 by Mr. Hawley, Republican Representative from Oregon, chairman of the House Committee on Ways and Means, and represents the work of the majority members of this committee based on two months of testimony. It was accompanied by a tentative "basis for a report" dealing with the work of the sub-committees.

The measure provides for a reorganization of the Tariff Commission, and important changes in the special and administrative features of the Tariff Act of 1922. These changes include a different principle to be made applicable in carrying out the flexible provisions of the Act, and a method designed to ascertain more readily the value of imported merchandise.

The Coal-Tar Clauses

In paragraphs 27 and 28 covering coal-tar chemical products, including dyes, the specific rate of 7 cents per pounds and the ad valorem rates of 40 to 45 per cent, based on the American selling price of the domestic products in the case of competitive chemicals, remain unchanged. The rate of 25 per cent in the important basket clause also stands. The American valuation principle, which applied *only* to coal-tar chemicals in the 1922 act, has been extended to other paragraphs in the tariff. Very important also is the fact that the flexible provisions in Section 315 of the present tariff apply in the new bill to coal-tar products. In the existing law they apply to every paragraph *except* those covering coal-tar products.

On the sub-committee on Chemicals, Oils and Paints were Lindly H. Hadley, chairman, Richard S. Aldrich and James A. Frear. In their consideration of the chemical schedule (Schedule 1) the Tariff Commission has made available a greater wealth of statistics of imports, exports and production, of prices and costs of production than has perhaps been possible in the case of any other schedule. Full consideration was given to the testimony and the contents of the briefs submitted at the hearings on chemicals and allied products held at Washington in February.

What follows is largely quoted from the report of the chemical sub-committee:

The equivalent ad valorem rate on all chemicals, dutiable and free, imported under the act of 1922, is 9.39 per cent, as compared with an equivalent ad valorem rate of 14.04 per cent on total imports of all kinds during the same period. Therefore, it cannot be successfully contended that the rates of duty in Schedule 1 of the act of 1922 are above the levels of other schedules.

In general, the treatment of Schedule 1 by the committee is in no sense a revision, but rather a readjustment in certain items in order to meet the changed conditions in certain industries since 1922. This schedule, covering chemicals, oils and paints, contains many hundreds of items. The committee received requests for changes in seventy of the ninety-three paragraphs of the schedule. Changes have been made in rates in only twenty-nine of these paragraphs.

A number of chemicals which have become of importance in the industrial change since 1922 have been given specific mention for the first time. The rates in paragraph 5, the basket paragraph, and in the basket clauses of other paragraphs, have not been disturbed.

The chemical industry has undergone striking developments during the seven years in which the present tariff act has been in operation. New processes have reduced costs and rendered old methods obsolete. Many new products have been developed. The ability of America to apply research to the solution of manufacturing problems and the development of new products has been most gratifying, and gives us every reason to believe that we are on the threshold of even greater and more far-reaching achievements in the course of the next few years.

Progress of the Dye Industry

The years since 1922 have been characterized by sharp competition between domestic manufacturers, a decreasing number of manufacturers, cheaper prices for dyes and other products, and an increased demand for fast colors. The development of fast dyes has been brought about by the devotion of a large amount of money and time to the problems involved. The increased production by improved methods of the important intermediate, Anthraquinone, greatly facilitated the development of fast dyes.

Other important developments in the coal-tar industry include the production of phthalic anhydride by cheaper methods, of synthetic phenol from benzene, the development of insecticides and fungicides, by which increased yields and improved qualities of such crops as wheat, corn, potatoes, and other farm products may be obtained. The production of new chemicals for the rubber industry is of more than usual significance. The development of new pharmaceuticals for the control and prevention of disease is one of the most important contributions of chemistry to the welfare of mankind.

Requests were made for the restoration of the original rates which obtained in paragraphs 27 and 28 for two

years after the date of the passage of the Act of 1922.

These rates were automatically reduced under the provisions of the act from 60 per cent ad valorem to 45 per cent ad valorem in paragraph 28 and from 55 per cent to 40 per cent ad valorem in paragraph 27.

In view of the creditable progress of the industry and upon the further facts as to its status and condition disclosed upon the hearings, the committee recommends the continuance of the present rates based upon the American selling price as provided in the present law.

Attention is called to a further important recommendation, viz., that the provision of the existing law prohibiting any increase of the rates in paragraphs 27 and 28 under section 315 be stricken out. In view of the automatic reduction from the temporary to the permanent rate above specified there does not appear to be any sound reason for longer retaining this distinction in the application of the flexible provision. The adoption of this recommendation will afford thereafter the benefit of this remedy to all items in the schedule.

Changes in Administrative Principles

Under the changes in the administrative sections of the tariff the Tariff Commission is in effect recreated. The number of members is increased from six to seven and their compensation from $10,000 to $12,000 per year. Members of the present committee may be reappointed by the President, but no restriction is placed upon his selection of appointees.

The principle to which the President must conform in carrying out the "flexible provisions" is the equalization of "conditions of competition in the principal market or markets of the United States between domestic articles and like or similar competitive imported articles." It is believed that this standard will effect more speedy adjustments and the conditions will always be ascertainable.

The President may, after investigation, if he finds such differences cannot be equalized, proclaim that the ad valorem rate or rates of duty shall be based in whole or in part upon such American selling price as in his judgment is shown to be necessary to equalize such conditions. The limitation is retained, that the increase or decrease shall not exceed 50 per cent in the rate specified in Title 1 of the pending bill.

In ascertaining the differences in competitive conditions five things are given consideration:

1. The cost of production of the domestic article or the price at which such article is offered for sale.

2. Costs of production of the imported article or the price or value set forth in its invoices or its import cost.

3. Other costs of the domestic article and of the imported article including the cost of all containers and coverings of whatever nature and other charges and expenses incident to placing the article in condition packed ready for delivery.

4. Costs of transportation.

5. Advantages granted to a foreign producer by a government, person, partnership, corporation or association in a foreign country.

LUNCHEON OF THE AMERICAN INSTITUTE

The close of the Twelfth Exposition of Chemical Industries held last week at the Grand Central Palace, New York, was marked by a meeting at the Hotel Commodore of the American Institute of the City of New York, on Saturday, May 11, known as the Chemistry in Industry Meeting.

On the program of speakers for this meeting were Dr. C. E. K. Mees, of the Eastman Kodak Company, who spoke on "Chemical Research, the Yeast of Business"; Dr. Arthur D. Little, of Arthur D. Little, Inc., who took as his subject, "What Chemistry Means to Business"; Dr. W. E. Emley, of the National Bureau of Standards, who addressed the meeting on "The New Industry Created in Making Xylose Sugar from Cottonseed Bran"; and Dr. H. E. Howe, editor of Industrial and Engineering Chemistry, who spoke on "Dollar Value of Chemical Research."

In the course of his address Dr. C. E. K. Mees said in part:

Just as yeast will ferment a sugar solution, growing itself at the expense of the solution but consuming only a very small amount of material in comparison with the amount which it produces, so in the last twenty-five years and especially in the last ten years the rapid growth of industry has been to a great extent dependent on the fermenting influence of applied science. Twenty-five years ago the industries relied upon the universities for the production of the science that they required, and for its application depended upon a few technical men employed in the factories; but to-day the growing complication of modern industries has forced them to pay as much attention to scientific development as to any other section of their work, and at the present time a research laboratory of some type is to be found in almost all technical industries.

There are many examples of manufacturing companies whose prosperity has been suddenly cut short because of their failure to provide an adequate supply of new inventions making possible the development of improved products. There are also many examples of laboratory work which has resulted in the establishment of new industries or in the revolution of the older ones. Among the latter may be mentioned specifically the introduction of sound into the motion picture industry as a result of the work of the laboratories of the electrical industries and the revolution in the paint and varnish industry as the result of the development of cellulose lacquers arising primarily from the discovery of new methods of producing solvents. It is not impossible that great changes will occur in the automobile industry as a result of a study of the structure of petroleum oil.

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

President
E. H. KILLHEFFER
Newport Chemical Works, Passaic, N. J.

Vice-Presidents
WALTER S. WILLIAMS—P. J. WOOD

Secretary
ALEX MORRISON
American Woolen Co., Andover, Mass.

Treasurer
WINTHROP C. DURFEE
516 Atlantic Avenue, Boston, Mass

Councilors

RALPH F. CULVER	GEORGE A. MORAN
B. F. PHETTEPLACE	HUGH CHRISTISON
WILLIAM R. MOORHOUSE	WALTER M. SCOTT

Past President and Chairman of the Research Committee
LOUIS A. OLNEY
Lowell Textile Institute, Lowell, Mass.

LOCAL SECTIONS AND THEIR OFFICERS

Northern New England Section—
William H. Cady, Chairman, Pacific Mills, Lawrence, Mass.
Harold C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass

Rhode Island Section—
Richard B. Earle, United States Finishing Company, 389 Charles Street, Providence, R. I.
A. Newton Graves, Secretary, Franklin Process Co., Providence, R. I

New York Section—
Daniel P. Knowland, Chairman, Geigy Company, N. Y. City.
Philip H. Stott, Secretary, Newport Chemical Works, Inc., Passaic, N. J.

Philadelphia Section—
A. M. Burt, Chairman, 1046 Public Ledger Building, Philadelphia, Pa.
Percival Theel, Secretary, Philadelphia Textile School, Philadelphia, Pa.

Piedmont Section—
Prof. Chas. E. Mullin, Chairman, Clemson College, Clemson, S. C.
Thomas J. Nuckolls, Secretary, Renfrew Plant, Brandon Corporation, Travellers Rest, S. C.

South-Central Section—
L. L. Bamberger, Chairman, 201 College Street, Cedartown, Ga
I. V. Sheffield, Secretary, United States Finishing Company, Cedartown, Ga.

Midwest Section—
Carl E. Bick, Chairman, Real Silk Hosiery Mills, Indianapolis, Ind.
Clarence Wille, Secretary, Burson Knitting Company, Rockford, Ill.

Lowell Textile Junior Section—
A. Kempton Haynes, Chairman; Walter C. Lindsly, Secretary

COMMUNICATION

The Proposed Association Laboratory

Why I Oppose a Textile Laboratory as a Part of the American Association of Textile Chemists and Colorists

By CHAS. E. MULLIN, M.Sc., F.A.I.C., F.C.S., F.T.I.
Professor of Chemistry and Dyeing, Clemson College Textile School, Clemson College, S. C.

WITHIN the past couple of years we have heard a great deal in regard to a proposed chemical laboratory to be operated by the American Association of Textile Chemists and Colorists. Most of what we have heard had been in favor of this laboratory and may lead some of the members who have not discussed this matter to believe that all members favor the association operating such a laboratory.

As is the case with most other movements, there are two sides to the question, and certainly not all of our members are in favor of the Association's entrance into the chemical analytical, consulting and research business As no one else has reviewed the arguments against this proposed very unusual departure from the functions of a technical society, I am willing to assume the responsibility of expressing some of my own opinions on the subject and hope that other members will do the same, regardless of whether they agree with me or not.

WHO SHALL START THE LABORATORY?

I. The American Association of Textile Chemists and Colorists, as the name indicates, was founded by and, let us hope, for textile chemists and colorists. At least this is indicated by the title and it was so understood by many of the charter members, including myself, as well as many other dyers and chemists joining later. I believe that I am correct in stating that it was not founded as a manufacturers' association, and it has certainly not received the majority of its membership from this group, but rather from the employees of the industry, the textile chemists and dyers. There is no reason whatsoever why the employees of the industry should start such a laboratory for the industry. Any such movement should come from the manufacturers themselves and be supported entirely by their funds and efforts, entirely apart from those of the employees. As I shall point out later, only the mills (employers) can benefit from such a laboratory and there is no reason why the chemists and dyers

(employees) should donate their efforts, time, or money in this direction when there are many other things in which they are more directly concerned.

Personally I heartily indorse the foundation of such a laboratory by the textile industry or any part of this industry. It is one of the greatest needs of the industry, but it is for the industry and should be organized by and as a part of this industry and not by our association.

Benefits to Members

II. Many of our members believe that if such a laboratory is founded, they will be able to submit their individual problems in dyeing, etc., to the laboratory for solution. If this laboratory is financed by the manufacturers, and certainly none of the employees' money should be used for this purpose, it is only logical that the manufacturers themselves will select the problems for investigation. It is foolish to think that simply because a dyer is a member of the Association, this laboratory is going to give him and his problems personal and prompt attention.

There are many reasons why this proposed laboratory could not give individual attention to the problems of each and every dyer and chemist in our Association. In the first place, how many of these problems do you think would arise? How many of these problems do you have in a week, month or year? The other fellow has just as many. Which problem will receive the first attention? Which one is most important to you and the other Association members? Who is going to pick out your problem for immediate attention?

If all of this proposed research should result in the discovery of a method of dyeing cotton the fastest and best black in the world for five cents a ton, it would not benefit any individual dyer or chemist five cents, except indirectly as proving the value of research. It would only benefit the manufacturers who are in position to use the cheaper dyed cotton. Therefore there can be little direct benefit to our members, the textile chemists and dyers, from such a laboratory.

Fundamental Research

III. But by far the major reason why this laboratory could not consider the individual problems of our members is that if any real research is to be done upon any one branch of the textile industry, this research must start at the very bottom, with the fundamental scientific principles involved, rather than with the immediate solution of the one small problem of any one man. Research, to be of value to the industry as a whole, must start with a study of the scientific principles involved, rather than with the problems of any one dyer, chemist, or plant. Research, to be research for the textile industry, must start at the bottom and build up on a solid foundation. This is what the textile industry needs and not such a patch work job as would result from the consideration of individual problems.

Scope of Textile Research

IV. Any such research movement in the textile industry, in order to be really successful, must include every branch of the industry and correlate these branches. It must include physics as well as chemistry. Perhaps physics may be even more important than chemistry when we consider the textile industry as a whole. Is our association, either as individuals or as a whole, capable and competent to administer and direct research upon such a broad scope?

It is just about as logical to start research for the textile industry as a whole in a chemical laboratory only, as to start research upon the application of the direct colors to silk with the hope of helping the dyestuffs and dyeing industry as a whole. To be really successful this textile research must cover every phase of the industry, from the production of the fiber to marketing the finished goods.

Last summer I visited almost all of the textile research laboratories in Europe and England, as well as most of the textile schools, many of the colleges, universities, etc., handling textile and other research. At the present time I am planning to return to Europe about May first to continue this investigation of the textile, dyestuffs and related industries, textile education, research, etc. The above statement is not only my own opinion on this matter but that of by far the majority of the men actually engaged in this work abroad. It is the opinion of the men in England who have had the greatest success yet attained in textile research. The English laboratories go back to the breeding of the sheep in investigating wool; to the growing of the cotton in the study of cotton manufacture. It is true that these laboratories have been criticized somewhat by certain individuals for lack of results, but they have really done a wonderful work and have established a splendid foundation upon which to build the real advances of the future. Shall we in America do less by a patch work of chemical "research"?

Will the Laboratory Injure Our Members?

V. The American Association of Textile Chemists and Colorists was founded as a technical society and not as a commercial organization. It is not a proper function of a technical society to enter into business in competition with some of its own members.

It has been proposed to support the research laboratory

largely or entirely by doing analytical and other chemical work for the manufacturers. This is entirely wrong in principle, in that it places the association in direct competition with its own members for this business.

It has been proposed to take over these other (individual) laboratories. Some of our members may prefer to continue their own business. Shall they be forced out of business by the Association of which they are a member? Also, at what price shall these laboratories be taken over?

Legally Correct

VI. According to the Constitution of the Association, can we legally conduct such a chemical research and analytical business? As I see it, the Constitution of the Association certainly does not give us any authority to go into any such business. The fact that we are now incorporating, under the present Constitution, does not alter this phase of the matter, and neither has the committee of incorporation, nor any other committee, any right to alter this Constitution in any way. The act of incorporation in no way alters the matter except to render the Association legally liable.

Must Stand on Its Own Feet

VII. If this proposed textile chemical research laboratory cannot produce results sufficient to support itself, and to justify its support, it does not warrant its existence, and those back of the movement cannot have much faith in its real value when they propose to support it by profits from analytical, control and other chemical work. A research laboratory, just as any other institution, must stand on its own feet or perish.

VIII. Chemical analytical or control work and research are entirely different types of work and demand quite different types of training and men. Even if handled by the same major organization, they should be entirely separate and distinct. If a laboratory is started by our Association for research, and I have yet to be convinced that this is a proper function of our Association, there is no reason at all why this laboratory should handle anything at all but research.

Does it seem quite fair that the Association should enter into competition with many of its own members for analytical and other chemical work in order to support research for the textile industry? Would it be ethical for the Association to go into the dyeing business? The fact that the industry needs a research laboratory and that certain members of the Association wish to start such a laboratory for the industry certainly does not justify sacrificing the interests of even one of our own group of members.

There is no more reason why the A. A. T. C. & C. should enter into competition with its own members in research than that it should go into the manufacture of soaps, dyestuffs, books, etc., and for less reason than for it to publish its own journal. This is a proposition for the textile manufacturers themselves and not for a small group of their employees, the dyers and chemists.

Some of those in favor of the Association laboratory say that this proposed laboratory will not injure the business of the commercial laboratories. Then why agree to take over these private laboratories? If the Association's laboratory had secured the testing work which it made an effort to secure from one of the manufacturers' associations, instead of the private laboratory that did secure this work, it would certainly have been taking legitimate business from this private laboratory. It has been definitely stated in the Journal of the Society of Chemical Industry of 1928, as well as previously, that the British research associations for the textile industry have injured the business of the private laboratories. This is unfortunate but cannot be avoided, but at least the injured parties were not members of the association causing the injury.

IX. It also has been stated that the Association's laboratory, as such, will carry more prestige than a private laboratory. This is certainly true and is all the more reason why the competition will be unfair to all private laboratories, and especially those of our own members who have helped to build up the Association to its present position.

Help Our Own Members First

X. "Charity begins at home" and "The Lord helps those who help themselves." Two very old and true sayings. The first duty of any family, society, company or industry is to its own members. In this case the first duty of the Association is to its own members, the dyers and chemists. THEN comes its duty to the textile industry as a whole, and not before. I believe that there are many ways in which the Association can benefit its members better than by establishing an analytical and research chemical laboratory for the textile manufacturers.

No Demand for This Laboratory

XI. There has not been any demand on the part of the textile industry for such a research laboratory. It is true that the industry needs it badly, but why try to force the laboratory down its throat before it realizes the need? When the textile industry demands a chemical research laboratory, one will be supplied. If not by our association, perhaps by a co-operative movement within the industry itself, as it should be done.

A doctor does not go around forcing his attention upon his patients even though they may be sick, and why should chemists? If the industry does not need the services of this laboratory sufficiently to know that they need it, they will not need the results of all this proposed research badly enough to utilize them after the Association has obtained them, if it does. We do not value what we get for nothing. It is what we buy and pay out our good money for that we value and use. How many useless presents do you have laying around your house? Many of them useful things that you did not desire and do not use. We buy what we want and value it accordingly. The same thing applies to this textile laboratory. If the manufacturers are talked into it because it is "cheap" or because everyone else is going into it, they will never utilize the results. When the industry realizes the need for this laboratory (or for textile research) it will have the laboratory quickly enough, and then, not before, will it realize the value of and apply the results obtained.

What We Can Do for Our Members

XII. It is a proper function of the Association, however, to assist in every possible way in stimulating research in the textile and related industries, without itself taking a part in this research. The "objects" of the Association only include the "encouragement" of research and make no mention of conducting a laboratory for profit in order to support a research laboratory for an industry which has not even as yet supported the Association to any noticeable extent. Nor do these objects include the operation of a research laboratory.

While I have in the past been reminded that the "objects" of association, as founded, do not include any mention of benefits or direct improvement for the members (dyers and chemists) themselves, except on an educational basis, I consider this unfortunate.

I personally consider that one of the greatest services that the Association can render to the textile industry as a whole, and its own members in particular, is to improve the social and economic status of its members, the chemists and dyers in the textile industry. Advancement along this line will result in drawing more good men of the type badly needed in the mills into the textile industry.

Better Salaries and More Trained Men

I have repeatedly made the statement that employers get just what they pay for. Low wages mean low quality of work. Good wages and working conditions eventually result in a higher type of better trained men in the industry. More good men in the laboratories and dyehouses means more research, often of a practical nature, but right in the mill itself where it is so badly needed. It also means more applications of science to all of the mill processes, as well as application of outside research, and everyone knows we need more of it in the textile industry.

Every dyer and finisher knows that his department can take a good piece of cloth and, by excellent or poor work, as the case may be, either add sufficient value to this cloth in dyeing and finishing to double the profit in the goods or, on the other hand, by poor work kill all profit in the whole process of manufacture.

A chemist or dyer who can double the profit on the goods, or even increase it materially, deserves a good salary. He is a good man whether he ever went to school a day in his life or not, and if he does not get the salary he deserves he will be dissatisfied and not do the best work. Eventually he will move on to another position. The objection has been made that to increase salaries will not make better chemists and dyers. That is more or less true, but it will stimulate the many good men we now have in these positions to do even better work. Otherwise, if they do not turn out a grade of work comparable to the salary paid, a better man will soon be in their position. It certainly cannot be denied that the higher salaries will draw many more trained men of the type we need into the industry, so that the better salaries will mean better men in the long run.

Better Salaries

One of the great services that the Association can render to the textile industry to-day is to educate the mills to demand more well-trained chemists and dyers, as well as textile and other engineers, and to pay the salaries necessary to attract and hold these men in the industry. How this can best be done I do not know, but I have suggested it as a suitable problem for consideration and "research" by our Association. It will not only benefit the industry as a whole but also our own family of members.

At a meeting of the Research Council last fall I proposed such research, but the proposal was rejected on the basis that it did not come within the scope of our objects. Perhaps the objects of the Association should grow with the Association, and this object should be added to the Constitution.

The movement for better salaries, etc., has also been objected to on the basis that it will not make better chemists and dyers by increasing their salaries. However, this is a mistake. If the man has a good *position*, instead of an ordinary *job*, he will take a pride in this position and make every effort to hold it and to improve this position. The same man may not care at all whether he even holds a $50 a week dyehouse job. A good man will give just what he is paid for. If he receives a poor salary he gives only poor services; a good salary brings

out his best and he is proud to render service according to the remuneration received. Just apply this reasoning to yourself and see if it is not correct. Therefore, better salaries for dyers and chemists will make better dyers and chemists from the men now in the industry, as well as draw in more new ones. Understand, I am not advocating any labor union of chemists and dyers, merely an educational movement.

An Employees' Association

XIII. The A. A. T. C. & C. is the only really technical society of textile chemists and dyers in America. Personally I believe that it is desirable to keep it as an employees' association, rather than to encourage it to become a mixed association of employees and employers whose interests are certainly not identical. While there is certainly no objection to employers belonging to the Association, the objects, aims, and interests of the employer and employee are seldom the same.

How many of *your* employers would be interested in hearing a paper and long discussion upon a new method of applying direct or any other dyestuffs to cotton? Would *you*, as a textile chemist and dyer, be interested in spending an evening on a paper upon how a textile mill may improve its bank credit, or how mill cost accounting should be conducted? Yet these last two subjects are of great interest to our employers, while the previous subject is of major interest to dyers and chemists.

We have many manufacturers' associations in the American textile industry, but only one technical textile chemists and colorists association. The interests of employer and employee need not be antagonistic, but no one can deny that in most cases they are quite different.

Change in Our Membership and Interests

XIV. If this proposed laboratory goes through, it is logical to assume that practically all employers contributing to the laboratory will join the Association. If the proposed 1,000 mills contribute to the laboratory, the entire Association will be dominated by the manufacturers, rather than by the dyers and chemists. While I do not propose to make the Association a labor union of chemists and dyers, I think that it may be desirable to have this little employees' group all our own, rather than an association of larger membership, the majority of which are not directly interested in the very subjects of greatest interest to the founders and supporters of our Association, the textile chemists and colorists.

The employers may not, and very probably would not, intend to dominate our Association. However, the fact that we now have only about 1,000 members, not nearly all of whom are dyers and chemists, and would undoubtedly obtain many more than 1,000 new members from the employers of the proposed 1,000 mills to support the laboratory, would shift the interest of the majority of our membership to the subjects of most interest to employers. It would entirely shift the major interest of the Association from the very technical subjects now of greatest interest to the majority of our members.

XV. Furthermore, while the employers would not intend to take the reins of control out of our hands, the fact that they would constitute the majority of our membership, be by far the largest financial contributors, be better known than most of the chemists and dyers, and have more of their own time to give to the Association, would all automatically tend sooner or later to place the entire Association into their hands. The best way to get out of such a situation is to keep out. Let us not get into this position.

Common Interests and Friendship

XVI. The many meetings of the A. A. T. C. & C. that I have attended in all parts of the country have been a great source of pleasure and profit to me, probably more largely through the contacts I have made, and the friendships I have established with many other chemists and dyers engaged in the same line of work and with interests similar to mine, than through the technical papers presented. I will venture the opinion that *your* pleasure and profit from these meetings has also been just as much on this basis of friendship as from the technical papers. Let us keep this good fellowship and pleasure with us. Let us continue to have an employees' association rather than a technical and research laboratory to compete with some of our own members. We have plenty of things to do for our own members first and the industry as a whole second.

Changes in the Constitution

In conclusion, I offer the suggestion that a change of the objects in the Constitution of the Association be made so as to render research upon the improvement of the social and economic status of the members a proper function of the Association. I consider this just as important to the textile industry, as a whole, as the development of a research chemical laboratory.

Also, that before the Association enters into any chemical business, a similar amendment to the objects or Constitution be passed by the members authorizing such an unusual procedure on the part of a technical society.

I have taken a great interest in our Association from the start. I was one of the original charter members, suggested other possible members at the time the Asso-

ciation was being formed, and have interested many textile chemists and dyers in the Association since that time. I have attended meetings of almost every one of our Local Sections and addressed most of these Sections, as well as several of our Annual Meetings. I have served upon many of the Philadelphia Section committees as Chairman and otherwise, am at present Chairman of the Piedmont Section, a member of the Research Council, and Chairman of its Sub-Committee on Bibliography on Textile Chemistry and Dyeing, etc. Surely after this active interest no one can say that I am not interested in the Association and its work.

I believe that this proposed laboratory is wrong in principle and entirely out of place, and that it will benefit neither many of our members nor the Association as a whole. It may benefit a few of our members, but the good of the majority should not be sacrificed for that of the minority. What are your ideas on the subject?

Unfortunately, I shall not be with you again until fall to continue this discussion, but I am content to leave the decision in the hands of my fellow members.

Communication from the President

IN connection with the article written by Professor Mullin appearing in this issue, it seems fitting that some comments appear side by side practically with his article.

We indeed welcome comments upon the proposed activity of the Association, and, in fact, I personally have solicited comments, whether favorable or otherwise, on my visits to all of the various sections of our Association.

Unfortunately, Professor Mullin has seldom attended meetings of our Research Committee, and therefore is not entirely conversant with what has transpired from time to time, because obviously the published minutes cannot possibly carry everything that is said and done at each meeting, but rather only outline conclusions reached, if any. Because of Professor Mullin's unfamiliarity with everything that has taken place, his comments are based to a considerable extent on erroneous foundations, and quite naturally, therefore, his conclusions must of necessity be out of line also.

A Technical Association or a Manufacturer's?

Our association has always been, and I hope and expect it will always remain, an association of technical men. It is true that we have corporate as well as associate members, so as to allow anyone with sufficient interest in our purpose to join us and contribute to our work, but these two classes of membership do not carry any voice or vote in the affairs of the conduct of our association. The imaginary case of having papers presented on subjects such as mill credits, etc., is pretty far-fetched, because, in the first place, each section arranges their programs to suit themselves, the chairman of the section usually having a very substantial voice in the arrangement of these programs, and when it comes to the annual meetings of the Association I think the best answer is an examination of all past programs.

Fundamental Research for the Textile Industry

Everyone seems to agree that this is a much-needed thing. Professor Mullin also agrees, but advises that nothing whatever be done by our association in the matter until some definite demand is heard from the textile industry. I am wondering in what way that demand is going to come, and I am wondering also whether Professor Mullin does not agree with me that surely the technical men in industry should see and realize the need even quicker than the non-technical. If the technical man is interested and is progressive, he is willing to take a broader view than just his personal benefit; and he, it seems to me, is the man to put forward the idea for the powers that be to adopt, if they so desire. On the subject of this research is one of the places where Professor Mullin's article is built on a wrong foundation, and therefore naturally leads to wrong conclusions.

At a recent meeting in New York of a research group, most largely attended by members of our own Association, but where there were also present other men connected with the textile industry, I made it a point to state very clearly that real research for the textile industry would by no means stop with the chemist, but would include the physicist, the bacteriologist, perhaps the botanist, and a whole group of scientists, taking in the entire scope of the textile industry, broad as it is. There was never any thought of taking on special researches as a research for individual members, because obviously that would be most impracticable. The committee has at no time taken a narrow view of what fundamental research meant; in fact, at this same meeting just referred to Professor Olney stated at quite some length just what fundamental research would mean. The suggestion that what the Research Committee had in mind was sort of a patchwork chemical research is most unworthy.

There is so much that is destructive and so little that is constructive in the article under discussion that I am somewhat at a loss to know just what conclusion is meant to be drawn from some of the remarks made

under the heading "Scope of Textile Research." Are we meant to conclude that the men in the research institutions in Europe advised against the formation of similar associations and activities in America, or just what is the conclusion to be drawn at this point? I have also visited many of these places in Europe, some of them quite recently, and the expressions I heard were quite the reverse and were rather of surprise that we were so slow in America in going forward with any such movement. I can scarcely believe that Professor Mullin is advocating that this sort of research work be left entirely in the hands of the Europeans, and that we should just continue to sit back as we have done for many years and wait for some kind of a demand, more insistent than there is to-day, from our own textile industry. My own thought is that if we are good employees of the textile industry here we should be just as much interested in its prosperity and its general progress along scientific lines as though we owned the company for whom we work.

Testing Laboratories as an Adjunct

The idea has been put forward by myself and by others that perhaps a testing laboratory on a high plane would be a valuable adjunct of a research bureau, and that it might contribute something toward the support of the Research Bureau. This idea has only been put forward as such and for the consideration of everybody interested, and, while it has been more or less discussed, I think that it is now some months since most of the members of the Research Committee have considered that particular phase as being abandoned as unwise, and that pure scientific research should not be mixed in any way with an activity which would, after all, be more or less commercial.

Professor Mullin is apparently unfamiliar with this development, and consequently the very great deal that he has to say on this particular phase is something that has been practically discarded anyway, and in that respect, therefore, we are meeting with his views in the matter. He is under some misapprehension, however, when he says that we tried to secure the testing for the Cotton Finishers' Association, the contrary being the fact. It was practically offered to our Association, and our Association refused it; but even had we taken it on we would not have been doing what Professor Mullin says, "taking the business from a private laboratory," because the private laboratory which got the business had not previously done any textile testing.

Different Conceptions of Proper Association Activities

It seems to me, the main difference is in the conception of what the activities should be. The Council has always taken the broad view that its activities should be truly conservative and for the good of the industry as a whole. It is, of course, interested in the individual welfare of its members, and it believes that in adopting work for the benefit of the whole industry it is promoting the welfare of its members.

Certainly, I personally cannot subscribe at all to the thought that our Association as such should so far forget its function as a technical society as to actually make a trade union campaign for better salaries, and from a good deal of experience I would say that the practice is for good salaries to follow good work rather than good work to follow the good salaries. The good workman, whether he be chemist, dyer or what not, usually receives proper recognition, and if he doesn't that is more his individual problem than it is a function for a technical association. On this point I am expressing my personal opinion only, and am not in any sense speaking for the Council.

Professor Mullin expresses the desire to hear from a large proportion of our membership on this subject. I am heartily in accord with this view, and so have expressed myself many times. The very slow progress we have made so far is sufficient proof that we are not rushing into anything in a hurry, and we want to be very sure that any activity in which we engage commands the full support of the membership of our Association.

Peculiarly enough, the only section of our Association that went on record by vote in favor of the active prosecution of this plan and idea was the Piedmont Section.

E. H. Killheffer.

MARCH MEETING OF THE NORTHERN NEW ENGLAND SECTION

MEMBERS of the Northern New England Section gathered for their March meeting at the Riverbank Court Hotel on Saturday, March 2. William H. Cady, presiding as chairman, introduced the speaker of the evening, William H. Cotton, of the General Dyestuff Corporation, who addressed the meeting on "Color Effects on Acetate Rayon." The Chairman's introduction and the complete address follow, and a report of the discussion is appended.

Chairman Cady—We are most fortunate in having a speaker to-night who is not only thoroughly familiar with his subject, but knows how to put it over. Those

of us who heard him address the Annual Meeting at Providence know that one man who was received not only with interest but with enthusiasm was Mr. W. H. Cotton, who will speak on color effects on acetate rayon.

Color Effects on Acetate Rayon

By William H. Cotton

MR. CHAIRMAN and Gentlemen: Color effects on acetate rayon is a subject which is interesting the textile industry to such an extent at the present time that I thought perhaps it would interest you to hear in a short and concise form something about the processes used for obtaining the desired effects. I would not have you believe that I am myself very well informed on this subject, for I think that none of us know yet how to solve the many technical problems which acetate rayon presents. Acetate rayon is so comparatively new to us as a fiber, and is so different from the other fibers with which we are familiar, that all the work which has been done up to this time we must look upon as pioneer work, and I am sure that in years to come you will find that many new colors and new groups of colors will be discovered which will probably be far more efficient than the colors which we have at the present moment, and I am sure that many new processes will be invented and discovered for handling and dyeing acetate rayon.

Now gentlemen, what is acetate rayon? It is a cellulose compound very different from all the other known cellulose compounds, such as cotton, viscose and so on. As you all know, acetate rayon is very easy to identify. If you burn it, it burns practically the same way as animal fibers. It melts to a black ball, but has not got that characteristic smell which animal fibers have when they burn.

Another very simple reaction, in order to identify acetate rayon, is the solubility in acetone. Acetate rayon is the only known fiber which is soluble in acetone. There are other solvents also which will dissolve this rayon, but I think that acetone is the best one for identifying it.

The third characteristic of acetate rayon is its high specific gravity.

Now, owing to its chemical structure, acetate rayon is very sensitive to the action of alkalies because saponification of the rayon readily takes place. If you treat this rayon with alkalies, especially at a high temperature, partial or complete saponification takes place and once the acetate rayon is saponified, then of course it loses its characteristic properties, and what remains over is really nothing different from cotton or viscose in its affinity to dyestuffs.

Therefore, whenever we handle acetate rayon, we have to be most careful not to expose it to higher temperatures, or to the saponifying action of alkalies.

Another thing I should like to warn you against—I don't know whether any gentlemen present are connected with the garment dyeing trade, but in my experience garment dyers have had difficulty with goods containing acetate rayon effects. Very often garment dyers get rayon goods, either pure acetate rayon or goods with acetate rayon effects, and if they are not very careful with the solvent they use for cleaning purposes, they might injuriously affect the goods by dissolving the acetate rayon out of the material. As I mentioned before, acetone dissolves this rayon, even at a low temperature, and most of the chlorides of hydro carbon act in a similar way. Benzine and methyl-alcohol do not injuriously affect acetate rayon.

Injurious Action of Solvents

It is a curious fact that a mixture of certain solvents acts injuriously on acetate rayon, even if the components by themselves do not affect it. I know of a case where a garment dyer had used for cleaning purposes, instead of pure benzine, a benzine that contained very large quantities of benzol. The benzine itself has no effect upon the rayon, but if it contains considerable quantities of benzol it is very detrimental to acetate rayon.

Now, gentlemen, before dyeing or printing acetate rayon, the goods must be washed in a lukewarm soap bath, with the addition of ammonia, and it is necessary to be very careful that all the size is removed.

As regards bleaching, I do not intend to go into that question much, to-night, because I want to speak more of the production of color effects on acetate rayon; but the acetate fiber is so white and clean that in most cases it is not necessary to submit it to a bleaching process. But when, of course, rayon effects are used in combination, in woolen or cotton goods, then of course you have to bleach the goods and I think in the case of woolen goods with acetate rayon effects, perhaps a permanganate bleach, whereas in cases of cotton goods with acetate rayon effects, the hypochlorite bleaching process is to be recommended.

Now, gentlemen, when acetate rayon was first put on the market it was natural that the dyestuff manufacturers first tried to see what affinity the dyestuffs which had been on the market for many years would have for this rayon, and they were surprised to find that it has an entirely different affinity to the well-known types of dyes which had been used for cotton and the other rayons. I think the reason is partly a chemical and partly a mechanical one. The chemical reason is that acetate rayon has a chemical structure which no other cellulose compound has, and that for that reason the affinity of dyestuffs for it is not the same as for viscose or cotton. On the other hand, the acetate fiber is rather water

repellent, and that is a mechanical feature which we have to contend with in dyeing and in printing acetate rayon.

So far as I know, gentlemen, the first group of colors tested and tried on acetate rayon were the basic colors. And that is quite natural, for the basic colors are the oldest colors on the market, and everybody wanted to see what effect the basic colors would have on acetate rayon. It was soon found that the basic colors had an affinity for acetate. In other words, it is not necessary to treat the acetate rayon with a tannin mordant or a similar substance to tannin. One can dye acetate rayon with basic colors direct. The shades which are obtained in this way are not very full, and chemists looked around to see how they could improve the depth of the basic colors on acetate rayon.

Special Mordants on Basic Colors

It was then found that fuller shades could be obtained by adding ammonium salts or such substances to the dye bath as improve the absorption of the dyestuff by the fiber. A product of this nature which is on the market to-day is Celloxane. Besides that, some firms have recommended special mordants for dyeing acetate rayon which give darker shades with basic colors.

The shades that we obtain with basic colors are fast to washing. It is rather interesting to find, however, that the fastness to light of basic colors on acetate rayon is not the same as the fastness to light of basic colors on cotton. Some basic colors which are fairly fast on cotton are most fugitive on acetate rayon, whereas other colors which are considered fugitive on cotton, are not at all bad on acetate rayon. As an example, I would like to mention Malachite Green and Setocyanine, which are among the fastest basic colors to light that we have on acetate rayon, whereas Methylene Blue, on the other hand, is much faster to light on cotton.

Now, at the present moment, I do not think that the basic colors are of very great interest on acetate rayon, for they have been replaced by other colors, but still they are being used where very bright shades are required, and also in printing where color discharges are necessary to produce. I should like also to mention that the basic colors of the Setocyanine type are easily discharged and are therefore used sometimes for producing light blueish greens, which have to be discharged. But outside of those few cases that I have just mentioned, I do not think that the basic colors are being used or are of special interest for acetate rayon.

The Acid Colors on Acetate Rayon

Well, gentlemen, after the basic colors, the next group of colors which were tried on acetate rayon were acid colors. It was found that there were several representatives of this group of colors which have an affinity for acetate rayon, such as Azo Yellow, Victoria Yellow, Orange IV, Alizarine Sapphirole SE, Alizarine Irisole R, Alizarine Direct Violet ER. These colors are fairly fast to washing, and are, of course, faster to light than the basic colors which we have just discussed.

The dyestuff manufacturers then turned to chrome colors. Here again we were surprised to find that various mordant colors have an affinity for acetate rayon and can be used for dyeing acetate silk without a mordant. For example, I should like to mention a color which is especially interesting, Acid Alizarine Gray B, which gives a very pleasing shade of gray on acetate silk. Then it was found that colors of the Gallo group of chrome colors, used in former years extensively for printing, can also be dyed on acetate rayon. It was found that these colors could be used on acetate rayon without a mordant. And not only can they be printed or dyed on acetate rayon without a mordant, but they are very fast to light and washing and produce very pleasing blue shades.

The next group of colors which were tried in connection with acetate rayon were the direct dyeing colors. It was soon found out that direct colors had no affinity at all for acetate rayon, and that they left the fiber more or less white, and it is a rather interesting fact that if a direct dyeing color does stain acetate rayon, then the staining is due to an impurity in the direct color but not to the direct color itself. You all know that not every direct color gives a perfectly white discharge. Of course, there are some direct colors that you cannot discharge at all, but there are a lot of direct colors on the market which can be discharged, but the white is not a perfect white and is slightly yellow. In most cases those colors which stain acetate rayon will not give a pure discharge. It generally goes hand in hand, and is quite an interesting point.

Sulphur and Vat Colors on Acetate Rayon

Now we come to sulphur and vat colors. From the very beginning we could see that the sulphur colors which are used in cotton dyeing would have practically no interest for acetate rayon. And the reason is obvious—sulphur colors have to be dyed with alkalies at a high temperature and under those conditions a saponification of acetate rayon takes place. There is really no necessity of dyeing acetate rayon with sulphur colors, and I do not think it is likely ever to be done. We can, therefore, now turn to the question of vat colors.

With vat colors it is a little easier to dye acetate rayon than with sulphur colors, for the reason that vat colors are dyed at a lower temperature. But still they have to be dyed in an alkaline medium, and I therefore do not

think that they are a suitable group of colors to use in connection with acetate rayon.

Now, you may ask me: "Why it is that the printers print a lot of vat colors on acetate rayon and they do not seem to get a saponification?" That is a question which I have asked myself a great many times. Why does one not get the same saponification when you print acetate rayon with a vat color as when you dye it? I have no very good explanation, but I think that perhaps the thickening that one uses in printing the vat colors protects the acetate rayon fiber from the alkaline action

And now, talking about vat colors, I should like to say a few words about a new group of vat colors that have been put on the market, and which in my opinion have a greater interest for acetate rayon than the ordinary vat colors. The class to which I am referring is the Indigosols. I had the pleasure of mentioning the Indigosols in Providence a couple of months ago when I addressed your society, and spoke of their affinity for acetate rayon. But as I think a good many of the gentlemen present to-night were not in Providence, I should like to repeat now a few of the remarks that I made there.

The Indigosols

What are Indigosols? They are leuco compounds of vat dyestuffs. That is to say, they are vat colors in a reduced state, which have been put on the market in a stable and water soluble form.

From a chemical standpoint that is a very interesting thing. I always look upon a reduced vat dyestuff more or less like a raw egg, because it is so sensitive to every kind of reaction, and naturally it is not easy for the dyestuffs manufacturers to put that raw egg, as I shall call it, on the market in a stable form, and it is only after the discovery of the Indigosols, which were made out of this unstable leuco compound according to a new process, that a real stable leuco compound could be produced.

The vat rolors are made from the Indigosols by a process of oxidation.

The fastness properties of the Indigosols are, of course, the same as the fastness qualities of the colors from which they were made. It is possible to make an Indigosol out of every vat color—in fact, in the laboratory it has been made—but not all the Indigosols of vat colors have been put on the market for the simple reason that it is not always commercially feasible. The chief reason is that the yield of some of the Indigosols has been so small that it has not been possible to put them on the market at a reasonable price at the present moment. If you treat acetate rayon with Indigosols by the ordinary method, in which Indigosols are used on cotton and rayon, you will not get any results. If, on the other hand, you steam your goods for 20 to 30 minutes after you have put the Indigosols on your goods, in the printed state, and then treat those goods in a fairly concentrated sulphuric acid bath, you are able to fix the Indigosols on the acetate rayon.

And, gentlemen, the interesting thought is this, for the printer: At the present moment I consider, and I think it is generally considered, that the best black for printing on acetate rayon is Diphenyl Black Base. It is the black which is universally used.

Patterns Printed with Vat Colors

Now, there are certain difficulties in printing, when you come to printing vat colors next to Diphenyl Black, because one is an acid color and the other an alkaline, and when they touch, the Diphenyl Black is destroyed by the vat color. But with Indigosols you can print an Indigosol next to Diphenyl Black and they can touch and nothing will happen to them because they are both acid colors.

I would like to show you some patterns showing this effect. Here is a pretty pattern that I brought from Europe with me. I know it is similar to what you are doing here, and it is printed with vat colors. I would like to pass this around and I shall be glad if I can get the patterns I show you back again at the end of the meeting. They are not always quite so easy to get as you might imagine. In this little card you will see a complete range of Indigosols printed next to Diphenyl Black, and I think you will agree with me that they are very pleasing effects. The Diphenyl Black is a universal black which can be used on all kinds of materials, but it is especially suitable for silk, acetate rayon and other rayons. I will send around also for your examination this little card in which you see Diphenyl Black printed on all kinds of material.

Now, gentlemen, let us go further in our survey. The next group of colors that we tried on acetate rayon were the insoluble azo colors, colors with which you are all familiar and which are used for printing and dyeing cotton. It was found that if you reversed the process which was generally used for cotton you obtained very good results.

The usual process of producing these colors on cotton by preparing the goods with a Naphthol and then developing with a diazotized base has to be reversed. The base is dissolved in acid and the goods are treated with this solution until the acid bath is exhausted. Dyeing is commenced at about 105° F. and in half an hour the temperature is raised to 160° F. The goods are then washed, diazotized in a fresh bath, washed again and then developed with a Naphthol, Naphthol compound, resorcine, phenol, etc. In this way, we are able to pro-

duce insoluble azo colors on the fiber, and perhaps of all the colors used for acetate rayon these are the fastest. They are fast to washing, fast to light, fast to cross dyeing, and at the present time I think this is the best method of producing blacks on acetate rayon.

We have now discussed those colors which had been already on the market when acetate rayon appeared. We find that some of these colors are suitable, others are not suitable for acetate rayon, but naturally the dyestuff manufacturers were not satisfied with the results obtained so far and they looked for further colors to be used in connection with acetate rayon. And soon a new group of dyestuffs appeared on the market. These were water-soluble azo colors such as had no interest for cotton, but were brought out when acetate rayon became an important factor. They were put on the market under the name of Cellit and Cellit Fast Colors and are dyed with Glauber salt or ammonium chloride, and are fast to washing and fairly fast to light. This group is divided into two parts, the Cellit Fast Colors being faster to light than the Cellit Colors. It was also found that some of these were suitable for printing on acetate rayon but not all, as some of them are apt to sublime or bleed. But there are a few representatives of the Cellit group which are very suitable for printing, such as Cellit Fast Yellow GGN, Cellit Fast Red B, and 2B, and Cellit Fast Violet 4R, and some others.

And now we come to the most important group of colors for acetate rayon which have been put on the market so far, the water insoluble colors which have been put on the market in a colloidal paste or powder form, under various names, as you all know, such as Celliton, Cibacet, Celanese, Duranol, Cellatine, etc. These colors are dyed with an addition of soap or Turkey Red oil.

They are in a colloidal form and are absorbed by the fiber. I think they are the best colors to use on acetate rayon, but as I said at the beginning, I am certain that in the future we shall have new inventions and new discoveries which will give us still better colors for this fiber than those in question.

Dyeing Mixed Goods

I should like now to say something about the production of colored effects in mixed goods. We have discussed the kinds of colors suitable for acetate rayon. Now, what can we do with these colors when it comes to dyeing mixed goods? Let us start with the question of cotton and acetate rayon. And when I speak of cotton it can also be another rayon.

The problems which face the dyer are the following: Either we must dye the cotton and leave the acetate rayon white, or we must dye the acetate and leave the cotton white, or we must dye the acetate and the cotton the same shade.

If we have to dye the cotton and leave the rayon white, then naturally we take the direct dyeing colors, and such direct dyeing colors as we know do not stain acetate rayon, and there are many of these on the market.

If, on the other hand, we have to dye the acetate rayon and leave the cotton white, then we should take some of the colors of that water insoluble group which I have just mentioned, and which are in a colloidal state. Some of them dye the acetate rayon and leave the cotton white. In the third case, if it is necessary to dye cotton and acetate rayon the same shade, then you can dye the goods in a bath which contains a direct color, and one of these water insoluble colors in colloidal form.

For extremely fast work it is also possible to dye the cotton with a vat color and the acetate with a water insoluble color. This is a two-bath method, of course. In this case it is necessary to dye the vat colors at a low temperature, as low as possible, and to use those vat colors which dye with the minimum amount of alkali, and it is also better to add to the bath some substance which will protect the rayon, such as the so-called resist for acetate rayon. This resist tends to protect the rayon from the alkali.

In talking about these effects I would like to show you a few printed patterns which I brought from Europe with me. This material is a cotton warp and acetate rayon filling. The discharges have been made with vat colors. This second sample, which I will send around the room, shows a shot effect, and is done in this way: The goods are first dyed with a direct color, which dyes the cotton and leaves the acetate rayon white. This produces the shot effect. Then the goods are discharged with vat colors.

Now, gentlemen, talking about dyeing cotton and acetate rayon I should like to mention that the Indigosols are a very interesting class of colors for this special work. In fact, with Indigosols one can do almost anything on acetate rayon and cotton. One can either dye the cotton and leave the acetate rayon white, or one can dye the acetate and leave the cotton white, or one can dye the cotton and rayon one shade, or dye the rayon one shade and the cotton another shade.

Versatile Dyestuffs

No other group of colors can produce all these effects. Let us go through these few examples.

Suppose we want to dye the cotton and leave the acetate rayon white? Very well, we treat the goods with an Indigosol and nitrite, and without any steaming develop in acid. As we have not steamed the goods the Indigosols are not fixed on the rayon and are washed off.

Take it the other way round: suppose we want to dye

the acetate rayon but leave the cotton white. Then the goods are treated with the Indigosols and steamed. After steaming, the Indigosol is fixed on the acetate rayon. The goods are then washed. By washing, the Indigosol is washed away from the cotton and we have the color on the rayon and not on the cotton.

In the third case we will suppose that we want to dye the acetate rayon and the cotton the same color. Then we treat the goods with an Indigosol and steam them in order to fix the Indigosol, and we then develop in an acid bath without washing and are able to fix the Indigosol at the same time on the acetate rayon and on the cotton.

Now I can show you that it is possible to dye the acetate rayon with one Indigosol, and the cotton with another. Suppose we want to dye the cotton yellow and the acetate rayon violet. Very well. First, we treat the goods with Indigosol Yellow, and develop the goods without steaming. The yellow therefore is only fixed on the cotton and not on the rayon.

Now, we treat the same goods with an Indigosol Violet, and steam them. We now have fixed the violet on the acetate rayon. Then we wash and remove the violet from the cotton, the violet remaining on the rayon only.

Now, I should like to say a few words about the dyeing of woolen goods with rayon effects. In woolen goods, with acetate rayon effects, we have the same problems as with cotton. Either we have to dye the wool and leave the rayon white, or dye the rayon and leave the wool white, or have them both the same shade. If we want to dye the wool and leave the acetate rayon white, there are plenty of acid colors on the market which will give this effect. If we want to dye the rayon and leave the wool white, then the best colors to use are the water insoluble colors which in many cases only stain the wool slightly. After the goods are dyed they can be cleared to a great extent by a treatment with hypochlorite or hydrosulphite. If the goods have to be dyed the same shade, then it is possible to dye them in one bath, using such acid colors as dye the wool only and such insoluble colors as will produce the required shade, but will only dye the acetate rayon. One has to use, of course, such acid colors as dye in a neutral bath, and at not too high a temperature, but there are plenty of such colors on the market.

Silk with acetate rayon effects can be dyed like wool with rayon.

I have not time to go into details and would like to leave this point and say a few words about printing.

Discharge Printing on Acetate Rayon

At the beginning of my address I discussed the various colors which can be used for printing, and I should like now to say a few words about discharging acetate rayon goods. This is a problem which has interested printers for a long time. It was found that for discharging of such dyed goods it was best to use a zinc hydrosulphite formaldehyde compound. In other words, considerably better results can be obtained by using Decroline soluble conc., which is a neutral zinc hydrosulphite formaldehyde compound instead of Rongalite, which is a sodium hydrosulphite formaldehyde compound. But even with Decroline soluble conc. there are many colors used for acetate rayon which could not be discharged. Some of the basic colors of the Setocyanine type can be discharged in pale shades. Of the acid group there are certain yellows and oranges which can be discharged fairly well. Then it was found that among the insoluble azo colors which are dyed on acetate rayon and developed with Naphthol compounds there are quite a number of yellows, reds, and others that could be discharged.

The great difficulty has been to discharge navy blues and blacks.

At the present moment there are two methods of discharging navy blues on acetate rayons. I might state that both methods are patented in this country. The one method is with the help of the Gallo Blues. For example, Gallo Navy Blue S can be dyed on acetate rayon, as I mentioned, without a mordant, and this Gallo Navy Blue can be discharged with chlorate to a good white. One can also get color discharges in this way by using certain of the insoluble colors in colloidal form, which I have already mentioned. This process is also patented.

Now, the other process for discharging Navy Blue on acetate rayon is as follows: First of all, the goods are dyed with one of the bases of the Cellitazol B type, but not too dark. One must not go over a 0.3% dyeing. Then the goods are topped with a mixture of Cellit Fast Yellow R and Cellit Fast Red 2B. These Cellit Fast colors are readily discharged as well as the light blue bottom. If one increases the yellow and red in the second bath, one can get a black which is also dischargeable.

The light in this room is not very good, but I would like to send these samples for you to see the results of this method.

Well, gentlemen, in just the same way as the dyer can produce multi-colored effects on mixed fabrics, the printer can also produce very pretty effects. Suppose you have cotton goods with acetate rayon effects, then you can print these goods with a printing color which contains a direct color, and one of the water insoluble colors. What is the effect? The water insoluble color will go on the acetate and the direct color on the cotton, and you get a two-color effect. You can also take an acid color and mix it with a water insoluble color, and get in a similar way a two-color effect on acetate rayon and wool.

Gentlemen, I see that I have already spoken three-quarters of an hour, and I am sure that I have kept your attention long enough. I would like to say in conclusion

that I think we have a lot of work to do still with acetate rayon. I hope to have been able to give you to-night a short sketch of what has been done, but, gentlemen, there is a lot more to be done on these lines. I know there has been much literature published about acetate rayon, but looking it through one does not feel quite satisfied, and realizes that there are many problems yet to be solved, and I am confident that they will be solved.

The dyestuff manufacturers in all countries are quite open to the fact that what they have given to the textile trade up to now has not been perfectly satisfactory, and they are all working on it scientifically in the hope of being able to bring out some new colors which will produce better effects. If, by any chance I have been able to give any of you some ideas about coloring acetate rayon, then I will feel that perhaps your time and my time has not been wasted to-night, and, at any rate, I thank you very much for your kind attention. (Applause.)

Discussion on Dyeing of Acetate Rayon

Chairman Cady—Gentlemen, I know Mr. Cotton would be glad to answer any questions that anyone may ask. Who will ask the first one?

Mr. Cady—Is there as yet any straight green outside of the basic colors for acetate rayon?

Mr. Cotton—No, there is no straight green. Among the water insoluble colors which I mentioned there is a blue-green which, combined with yellow, gives a fairly good green. Also there is an Indigosol Green, one of the newest Indigosols which has been out on the market and which can be used for acetate. But in the Cellitazol group or in the water insoluble group, there is no green at present, and one can only produce a green with a blue green and yellow.

Mr. Sillersby—I would like to ask if it is possible to dye acetate rayon with vat colors in the ordinary way?

Mr. Cotton—The dyeing of vat colors on acetate silk is, of course, possible, but the question is how far will they injuriously act on the fiber. All vat colors can be put into two classes, those that dye at a lower temperature and those that dye at a higher temperature. One should only work with those colors which dye at a lower temperature, and it is necessary to reduce the alkali to a minimum. I have not myself seen any acetate rayon dyed with a vat color that has been perfect. It all depends on the saponification, and it is a curious fact that the saponification in dyeing is greater than in printing, and the reason may be that the thickening protects the fiber, as I explained before. Perhaps by adding something to the dye bath in order to protect the fiber from being saponified it might be possible to dye vat colors successfully on acetate rayon.

Mr. Durfee—I would like to ask if the presence of acetates has any effect in relation to the saponification?

Mr. Cotton—I do not think that an acetate would prevent the alkaline action on acetate rayon.

Mr. Joerger—I would like to ask Mr. Cotton if it is possible to exhaust the dye bath with the insoluble colors better and shorten the dyeing operation. Is there any other agent?

Mr. Cotton—The insoluble colors now on the market are colors in a very fine colloidal state, and in dyeing acetate rayon it is a question of the rayon absorbing these finely suspended colors out of the dye bath. It is a purely mechanical process of dyeing. It is very difficult, even with the help of any chemicals, to improve this mechanical process. At the present time the baths do not exhaust completely, but it may be possible in the future to find some substance which will facilitate the exhaustion of the dye bath.

Variations in Shade

Mr. Joerger—Another thing is that certain colors at different times give different shades with these insoluble colors. One particular color I have in mind dyes much deeper at a higher temperature than at a lower temperature. I wondered what was the highest temperature which might be used in dyeing. In the dyehouse where I am employed we use temperatures hardly over 140°, and most of the time much less than that. If there is any difference I should think that something might be done about it, in order to get uniform results.

Mr. Cotton—I think in dyeing acetate rayon one should not go over about 160° F. After that you dull your rayon by saponification.

Mr. Joerger—The black is a mixture, I think.

Mr. Cotton—With the exception of black, I do not know of any insoluble acetate rayon colors which are mixtures. There may be, but I think not. Therefore, from that point there is no reason why they should dye a different shade at a different temperature. I really think it is more a question of absorption. You will find that at a higher temperature the bath will exhaust better, but I know that you cannot go over 160° without injuring the rayon.

Mr. Lewis—Mr. Cotton, in dyeing rayon dresses which go into the garment dyehouse, isn't it rather an intricate problem to dye them, especially if they happen to be redyes? Are we not going to be up against all kinds of problems?

Mr. Cotton—You are quite right. Acetate rayon is causing garment dyers great trouble. In the first place garment dyers are not so much in touch with chemistry and they do not realize that they have a material with a fiber that they cannot treat like other fibers. They have

been accustomed to dye every fabric with union colors; now they have often first to clean the goods, and if they are not careful to take the right solvent they may dissolve the rayon and get holes in the material. Then for dyeing, special colors suitable for acetate rayon must be used.

Delustering Celanese

Professor Olney—How much danger is there from the steam printing process which you speak of, delustering Celanese?

Mr. Cotton—The delustering is not very great and I think the reason is that if you print vat colors the thickening retards the saponification. The insoluble colors for acetate rayon when printed and steamed on do not seem to affect the luster.

Professor Olney—There seems to be a great variation of opinion as to the degree to which saponification delusters. In some cases in the literature you find the statement that saponification completely delusters, and then you will find statements that it does not deluster. Now, which is really correct?

Mr. Cotton—In my experience heat delusters acetate rayon most. One can saponify this rayon without materially delustering it. In this case one changes the quality and makes a viscose out of it.

Professor Olney—Boiling water would deluster, wouldn't it?

Mr. Cotton—Yes. If you dye acetate rayon in a metal vessel and raise it to a high temperature and the rayon touches the hot metal, it is delustered completely. The action of hot metal is very injurious in this respect.

Mr. Leitch—Is it practical to dye acetate rayon in the package form, as in the Franklin machine?

Mr. Cotton—To tell you the truth, I don't now of anybody who is doing that successfully, but there may be a process for it. Most people prefer to dye acetate rayon in the hank, but it is possible that it is being done in a machine.

Mr. Leitch—What about the carbonizing of worsted goods with Celanese stripes?

Mr. Cotton—Do you mean how to do it?

Mr. Leitch—Yes, how to do it without injuring the Celanese.

Mr. Cotton—I think that is a very difficult thing to do.

Mr. Leitch—I understand that it is being done.

Mr. Cotton—I personally have had no experience in that. Perhaps one of the gentlemen present will tell us about it.

Member—It can be done with aluminum chloride.

Mr. Cady—Suppose you have accidentally delustered the acetate rayon. What is the best process for restoring it?

Mr. Cotton—I am afraid I cannot answer that question. I also think that perhaps one of the gentlemen present can answer it. I don't know.

The Future of Acetate Rayon

Mr. Chapin—If I may ask, what is the future of acetate rayon, in comparison with other goods?

Mr. Cotton—It is very dangerous to prophesy. I should say that theoretically acetate rayon will never be sold at the price of viscose. It will always be a more expensive fiber, and therefore I don't see how it can ever have the bulk consumption that viscose has. On the other hand, I do not think it will disappear from the market by any means because it has such interesting dyeing properties. With acetate rayon you can produce color effects in cotton goods which you cannot do with anything else except perhaps immunized cotton. One can produce color effects which we have not been able to achieve in any other way, and if the fashion or the public demands more and more of these effects, acetate rayon will increase in consumption. But I think it will never be able to compare with the cheap viscose, even though it is of better quality. Acetate rayon has a very important field and there is no doubt that it will be used and continue to be used. The consumption of acetate rayon has been increasing every year, and it will probably grow in future years, too. But in proportion to viscose it is still more or less a small quantity.

Chairman Cady—Any other questions, gentlemen?

Mr. Joerger—Have you had any experience with dyeing acetate rayon with Rapid Fast colors.

Mr. Cotton—For dyeing, of course, you would not use a Rapid Fast color, but only for printing. The Rapid Fast colors could be printed on acetate rayon, but I would not recommend them to be printed on it for two reasons: Firstly, the Rapid Fast colors are alkaline and if you print a Rapid Fast color on acetate rayon you might get a certain amount of saponification, and secondly, I doubt very much if you could produce a color this way which would not crock.

Chairman Cady—Any other questions, gentlemen? Perhaps some of you would like to ask your questions in private later, and there will be plenty of opportunity, I think, because the evening is early yet. We will give you that opportunity after adjournment. Is there any other business?

(*Meeting closed.*)

APRIL MEETING OF THE RHODE ISLAND SECTION

THE April meeting of the Rhode Island Section of the American Association of Textile Chemists and Colorists was held on Friday evening, April 26, in the rooms of the Providence Engineering Society.

The speaker, J. Preston Wills, gave a very interesting talk. The subject was "India."

Mr. Wills is the export manager of E. I. Du Pont de Nemours Company, and has just returned from India.

A. NEWTON GRAVES, *Secretary.*

APRIL MEETING OF THE NEW YORK SECTION

THE April meeting of the New York Section was held at the Alexander Hamilton Hotel, Paterson, N. J., April 26.

About sixty-five members and friends were present for dinner, and the total attendance of the meeting was nearly one hundred. The minutes of the March meeting were read and approved; the Treasurer's report was read, showing a balance of $7.96 as of January 30, 1929. On nomination from the floor, P. J. Wood was elected to serve as the Association's representative on the Nominating Committee for national officers. Mr. Knowland also appointed a committee to nominate members for the offices of Chairman, Vice-Chairman, Secretary and Treasurer of the New York Section. These will be voted on at the Annual Meeting of the Section to be held May 24. The committee appointed was H. Grandage, chairman, Dr. O. Flynn, L. Zismann, W. A. Kingmann and E. F. L. Lotte. It appeared to be the consensus of opinion that the Annual Meeting should be held at the Elmwood Country Club. This concluded the business part of the meeting. The gathering was then addressed by G. W. Steiger, of B. Thies, Inc., who gave a most interesting and instructive talk on the Thies Dyeing System.

This was followed by the usual discussion and the meeting adjourned at 9.45 p. m., after a rising vote of thanks to the speaker. Mr. Steiger's paper is published below and is followed by a report of the discussion.

P. H. STOTT, *Secretary.*

The Thies System and Its Practical Uses

By GEORGE W. STEIGER

MR. CHAIRMAN, MEMBERS, GENTLEMEN: I have long looked forward to the pleasure of addressing this notable gathering, and I want you to know my appreciation of that honor, as I have always felt that your Association is a sort of twin brother to the dyeing machinery business; we, perhaps, being more dependent upon you than you upon us.

Acting upon the suggestion of Mr. Stott, I have prepared a paper which I trust may give you a fairly comprehensive idea of the working of the Thies system as applied to the dyeing and bleaching of cotton yarn in package form.

George W. Steiger

At the outset, allow me to stress one point which has frequently been necessary in discussing our equipment with those interested in learning more about it, and that is the correction of what seems to be a general impression. Thies is a *system.* A system in fact, and not a single machine.

By that I mean that the boiling off, rinsing, dyeing and any after-treatment, depending upon the type of colors used, is not effected nor carried on in a single machine. Therein lies one of our several advantages. In no case is the routine tied up, as would be the case should all of these operations be carried out in one kier or tank. The Thies system is progressive, therefore continuous.

It might be well to sketch the background of our company's inception abroad, and lately its introduction in the United States. The originator and inventor of the system was Bernhard Thies, now deceased. His family has long been prominently identified with the dyeing and bleaching of textiles in Germany. His brother, Heinrich, specialized in and was recognized as one of the best known experts in textile bleaching, while the talents of Bernhard Thies were directed particularly to the dyeing and processing of textiles.

For a number of years he operated his own job-dyeing plant, which gave him the opportunity to de-

vise and work out in practical application numerous problems, which resulted in a vast improvement in the method of dyeing yarns in package form. He was a hard worker and possessed a broad, comprehensive vision, as was proved by the results he accomplished in his chosen field. When he died in 1922 there were some thirty-six patents to his name covering various phases of his package-dyeing inventions and developments.

Early Experiments to Prove a Theory

The records show that the first practical dyeing in Germany of cotton yarn in package form on a commercial scale was done by Mr. Thies. Starting first with the smallest yarn packages known in the textile trade, which are cops, and using them as a nucleus, he proved the correctness of his theory in a commercial practice. Then step by step he put these principles to work in a broader way, and finally dyed yarn in all of the standard package forms known to the trade. You may well realize that Mr. Thies suffered the usual pioneer's difficulties. His disappointments were many, but, possessing a tremendous amount of energy, he progressed to the point where his equipment could be readily handled by others on a commercial scale, and thus he definitely reached his final objective—perfect penetration, evenness of shades, saving of time. Just before the World War started he had his package system built up to the point where it was well-nigh perfect. That is, as perfect as anything mechanical can be devised. And he saw it installed in every textile center in Europe.

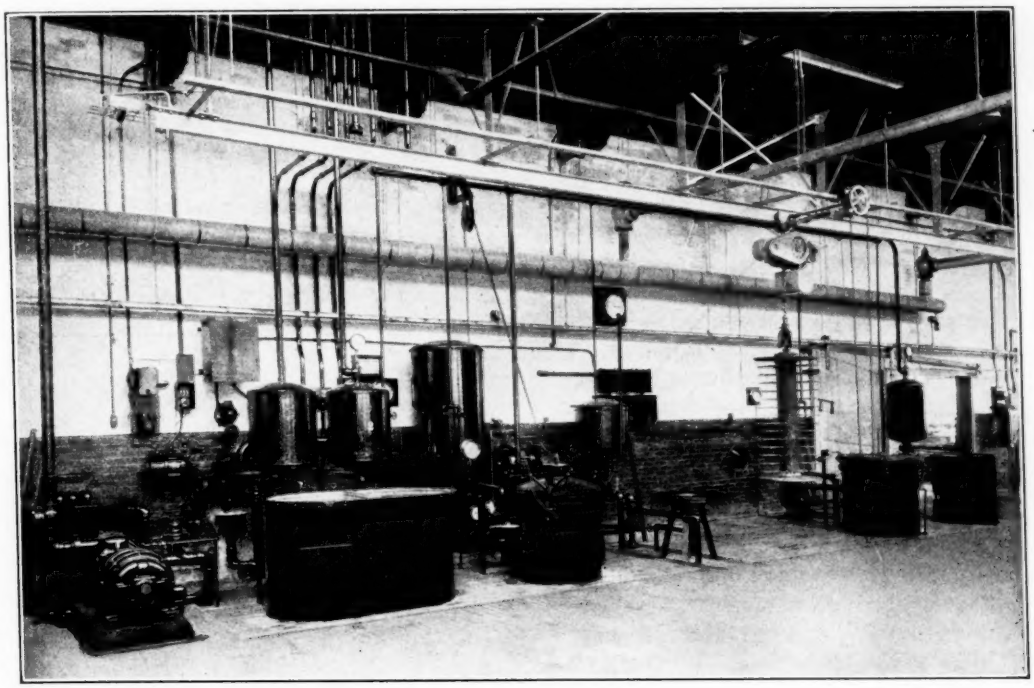
The introduction of the Thies system into the United States was at the instigation of the speaker and dates back some three years. Although new to this country, Thies installations are and have been in constant use for almost thirty-five years in the major European countries, spreading to Holland, Belgium, France, Italy, Spain, Czecho-Slovakia, Austria, Denmark, Norway, Sweden, England, and even recently in Soviet Russia. Bringing, as I did, a new type of equipment before the trade, you can perhaps visualize the difficulties which I necessarily encountered; but after my first sale had been made and the system had proven to the satisfaction of its purchasers the benefits and the perfection of performance, the succeeding business which I have obtained has followed as a natural course. It is a matter of considerable pride to me to know that, in the short interval that has elapsed since our first installation, the trade has taken so kindly to this new order in package dyeing. And that pride, I think, is justified when I tell you that one of the important plants in this neighborhood very recently placed an order with us for supplemental equipment which will bring their present capacity of some 75,000 pounds per week well over the 125,000-pound mark. The eminently satisfactory performance of the original installation was responsible. And this serves to demonstrate clearly the actual earning power of Thies machinery. Our equipment—every item comprising the complete installation—is 100% American made. Our own staff supervises erection.

We dye yarn on all of the standard forms of package that may be wound upon a perforated core or tube. This, you will appreciate, is necessary to allow the dye to circulate through the material, although I have seen abroad the dyeing of cops under a non-perforated tube. These packages, of course, were naturally of small diameter compared to the standard form of parallel tube or cone package. We also dye upon the beam, and can successfully penetrate and be sure of absolute evenness of dyeing of beams holding up to 200 pounds and even more. Any yarn sizes of 380 ends or 7,000 to 10,000 yards have been handled successfully.

Our system of bleaching on the tube is a feature of which we are justly proud. We have eliminated the labor element in the actual operation of this equipment to practically zero, and I will go into this feature separately a little later.

A Description of the System

To start a description of the working of our system, let us take the preparation of a package of cotton yarn for dyeing, selecting as an example the parallel tube, which is the most popular package. The yarn is wound on a perforated paper or metal tube, the package thus formed being 6 inches in traverse by 4¼ to 4⅞ inches in diameter. These measurements will give a weight of approximately 1¼ to 1¾ pounds per package of yarn. Of course, the packages may be wound to a smaller diameter if it is desirable. These yarn packages are next placed upon—or, more correctly speaking, slipped over—the spindle of the material carrier. The material carrier is a spool-like piece of apparatus of metal construction, the core or barrel of which is tapped with threaded holes, into which the spindles are screwed, projecting outward or horizontally from the barrel or the material carrier. Note that our material carriers are not an integral part of the kier. They are not stationary, but are lifted in and out of the kier or other auxiliary apparatus by an electric hoist or crane. These material carriers are interchangeable, and therefore a number of them may be prepared for dyeing or bleaching use, while others are going through the dyeing or bleaching process. We



Tube Dyeing Equipment at the Bloomfield, N. J., Plant of the Clark Thread Co., of Newark, N. J.

usually figure a set of at least three material carriers for each dyeing or bleaching machine. The size of the material carrier and the number of spindles thereon determine the batch capacity.

Now let us return to the package of yarn which is placed upon the spindles of the material carrier. Each spindle has at the end which is next to the material carrier barrel a recessed base which engages one end of the tube. When the tube is slipped over the shank of the spindle, a recessed nut is screwed upon the other end, making a vacuum-tight joint at both the outside and the base end of the tube. The wound yarn covers the perforated area. It will therefore be seen that the tube of yarn is held rigidly in a horizontal position. When the material carrier is completely loaded, the yarn is ready for the boil-off, scouring, dyeing and rinsing, and the package will not be removed from the spindle until all these processes have taken place and are completed.

As I indicated a moment ago, in using several material carriers one load is being boiled off, another is being dyed, etc. This makes the process a continuous one.

So that you may visualize step by step the working of a small installation, I ask you to take the catalogue before you and to note the illustration on plate No. 6 showing the installation of the Clark Thread Company's plant, Bloomfield, N. J. Looking at this illustration, and starting from the left, the first piece of equipment shown is a motor-driven vacuum pump. The vacuum storage tank is located in the basement beneath it. Continuing and slightly to the right, mounted on the dark portion of the back wall, is seen the governor valve, which is a motor-driven automatic device controlling the operation of the vacuum lines leading to the boil-off apparatus, extractor and the rinsing tanks. The function of this phase of our process I will explain later.

Boil-off Tank and Dyeing Kier

Next, to the right of the governor valve, is an oval-shaped double boil-off tank which accommodates two material carriers standing vertically side by side. Either side of this tank may be worked independently, as there is a partition which you may be able to discern as you look into the top of the tank. Some three-quarters of this tank is out of sight range, as it rests below the working-floor level on foundations in a pit, as does practically all of our equipment. Directly behind are two vacuum-control expansion tanks, one for each compartment. You will note that each piece of apparatus is equipped with its individual gauges, gauge glasses, etc.

Continuing further to the right, and directly in the center of the illustration, you see the dyeing kier. This, as previously explained, also extends below the floor level. This piece of equipment is readily distinguished by the rows of rivets running around the circumference. The top or cover is shown closed. Behind the dyeing kier is the expansion tank, which is the tallest piece of equipment shown, as the bottom of the tank rests upon the floor.

Next we see the extractor, which has a circular plate-like appearance with tripod support and is connected below the floor line to the vacuum storage tank and to a receptacle immediately behind it. This receptacle is shown directly beneath the clock, along with the motor controls.

Next to the right we see the material carrier, which is comparable in a way to a large spool. What appears to be spikes projecting from the center core of the barrel are in reality hollow shafts, the spindles to which I have referred. These, remember, hold the tubes of yarn for dyeing or other processing. This particular material carrier is shown hanging suspended from an overhead electric hoist which travels upon the "I" beam clearly depicted in the illustration. This, in common with all other illustrations, shows this "I" beam directly over the center line of the entire equipment. At your leisure you may study the different types of material carriers shown on plate No. 2 of our catalogue. You will also note a material carrier for raw stock, beam, cone carrier and tube carrier.

Let us now at this point turn the page showing the Clark installation which you are looking at. On the lower half you see the beam and tube dyeing equipment at the Judson Mills, No. 3. What I wish to call your attention to is the material carrier, which in this illustration is completely loaded with tubes of yarn. This material carrier is shown in place upon the extractor. This will give you an idea of the appearance of a material carrier when ready for work. In the foreground and lying on its side is one of our beams. This is usually wound with 380 ends, 200 pounds and 7,000 to 10,000 yards of yarn, and is handled exactly the same as the material carrier holding the tubes. Therefore, with no other change in our equipment except the beams themselves upon which the yarn is wound, either tube or beam dyeing, or both, may be done. A rod which we call a "lifting device," having a conical joint at the base, with a knob for hoist lifting at the top, is used in conjunction with the dyeing beam.

Now let us turn over the page again back to the Clark Thread picture and continue with that installation. We digressed after passing the material carrier. Therefore, still continuing to the right, we next see another tank used in after-treatment, which we term our single after-treatment apparatus. And the last item which appears at the extreme right in the picture is a rinsing tank, the expansion tank of which is shown behind it.

All the equipment shown in this illustration is of our Type 800 and has a capacity of 200 pounds of yarn per batch. The rectangular floor space immediately surrounding our equipment is of slatted wood construction, which allows for quick drainage of any slop-page or extraneous liquid, which on a solid floor would be a source of constant annoyance to the workers.

I might mention at this point that when conditions make the excavation of a pit of proper depth either difficult or impossible, the working floor area may be elevated so as to surround the apparatus in platform fashion.

I trust that you now have a fairly accurate idea of the usual routine as affected by an installation of this size.

Operation of the Dyeing Kier

Our system, you have possibly noted, is divided into two groups, the first consisting of one, two or more dyeing machines or kiers; the second group, one, two or more boil-off or after-treatment apparatus. The first group is operated independently by a specially designed centrifugal pump. The dyeing is all done with the kier cover clamped airtight.

It has always been my experience that the most interest is shown in the construction and the operation of the dye kier itself, which is in reality the heart of any dyeing system. I will, therefore, go into this feature with a little more detail. I refer you again to the illustration of the dyeing kier shown in the exact center and its expansion tank, which is used in conjunction with the kier shown and stands directly behind it. This expansion tank is entirely closed. Other systems use open expansion tanks. The entire dye liquor bath may be drawn from the kier into the expansion tank by vacuum as and when desired. This tank is connected to the kier by a four-way valve, through which the flow of dye liquor may be directed at the will of the operator. On the bottom of the kier is a female conical joint into which the male conical joint at the base of the material carrier engages and rests; thus, when the material carrier is lowered into position the joint so effected is air and liquid tight. This feature, I might add, is identical in all the other pieces of apparatus into which the material carrier is placed for the different processings.

You will note the row of rivets shown just above the floor line. This outer shell conceals what we call

a perforated jacket, meaning that the inside portion covered by this shell is perforated with a number of holes drilled into the inside surface of the kier at this point. This circular jacket is directly connected to the four-way valve. To operate the dyeing unit, the pump is started, the four-way valve is set to pump the liquor through the bottom of the kier and thence upward through the center of the material carrier and out. The dye liquor flow is therefore from the inside of the package out. To reverse the flow of liquor, a stop-cock is provided on the pressure side of the pump. This stop-cock is closed and a shift through the four-way valve is made so that the liquor now goes through the perforated jacket which I have just described and cascades in a circular flow over the material carrier until the tank is full. Then pressure comes into being, and this pressure forces the dye liquor from the outside of the package through the yarn, through the hollow barrel of the material carrier, and thence to the expansion tank. The shifting of the four-way valve is in no way complicated, being simply a matter of turning a lever, and is operated by hand. In our most recent models this shifting may be done by mechanical control, which eliminates the hand labor entirely.

With this new improvement, once the dyeing machine is loaded, and the cycle of the liquor flow from inside out and outside in is determined and the device is automatically set, it continues this cycle until shut off. This device may be timed according to the work in hand, say, one, two, three, four, or as many minutes as desired, from the inside out, and a like number, as may be desired, from the outside in. The time cycles may be regulated to any time measurements, such as two minutes outside in and five minutes inside out. The usual dyeing period is about forty minutes to one hour, and is according to the shades required and the type of dyestuffs used. The skill and knowledge of the dyer dictate his own table through practice. In Direct and Sulphur Black dyeing we are getting nine batches of work out in a ten-hour day.

The Boiling-Out and Rinsing Apparatus

Let us now take the second group, consisting of the boiling-out, rinsing and after-treating apparatus. The bleaching apparatus comes under this classification, although it is an entirely separate unit. The placing of the loaded material carriers in the various tanks and the removal of them are done by electric hoist or crane, just as in the dyeing kiers. The joint connection at the base of the tanks is identical. This, you will remember, I mentioned previously, but the liquor flow in this group is motivated by a different medium, that of vacuum exclusively. A governor valve controls this action.

The vacuum is created by a vacuum pump in a vacuum storage tank. No pumps are used with the various processing tanks, as is the case in the dyeing

Beam and Tube Dyeing Equipment at the Plant of Judson Mills No. 3, Lowell, N. C.

equipment group. The vacuum supply line runs from the vacuum storage tank to a switch pipe, which is connected to the equipment by a corresponding number of outlets. By means of this switch pipe any tank may be cut off or worked independently. The application of vacuum is controlled mechanically by the action of a motor-driven governor valve, the speed of which may be set for any given number of seconds of suction and release, consequently the flow is automatically controlled and automatically distributed. The tops of these tanks are open. When the material carrier is in position in the tanks and immersed, the sucking action starts. The liquor surrounding the packages is drawn through the yarn, through the spindles and hollow material carrier barrel, and thence through the pipe up and into the vacuum expansion tank situated directly adjoining. This phase of the operation completed, the governor valve functioning releases the liquid in the expansion tank through the admittance of outside air. The stored liquid then returns by gravity pressure back to the tank or, if so desired, may be released at this point directly to the sewer.

In rinsing, an efficient routine is established. Fresh water flowing in continuously reaches a certain level and is released automatically, passing from a special valve-like device, which operates automatically, to the sewer.

This releasing device is attached to the side of the tank and the operator may tell by glancing at the discharge water just when the rinsing operation has been completed. We are justly proud of the efficiency and perfection of our rinsing and boil-off apparatus, which really should be seen to be thoroughly appreciated.

Please bear in mind that while these operations which I have just described are in progress, the dyeing is going on continuously in the other group. There you have as clear a word picture as the speaker can phrase it of the various steps we employ. For after processing and developing the same general routine is followed, and I may add that the extractor is employed whenever occasion warrants. This apparatus draws by vacuum some 40% of the liquid contained from the packages, which is passed by check-valve to the sewer and is always used in conjunction with Indanthren dyeing for oxidation purposes. The dye liquor thus extracted can also be returned to the dyeing kier, if so desired.

Now a word as to proportion. We all know that a gallon of fresh water equals 231 cubic inches and weighs 8.33 pounds at 39° F. Our Type 1400 machine uses from 800 to 850 gallons, with a 525-pound capacity of yarn on tubes; our proportion, therefore, being about one to twelve, or 1 pound of yarn to 12 pounds, or is 1½ gallons of water. Our Type 800 machine, which is our 200-pound model, uses 300 gallons, with 210 pounds of yarn on tubes, or one to twelve. Our other size machines maintain this approximate ratio.

Difficulties with the Short Bath

We have carried on extensive experiments to determine just how long or just how short a dye bath should be. We have tried a shorter bath and have found it inadvisable for general practice, particularly when dealing with vat and Indanthren dyeings. A shorter bath, from an economic standpoint, used as a sales argument, sounds reasonable. There naturally must be a cost saving when less of any material is used. A short bath for blacks is fine, but when we run into lighter colors, or Indanthrens, the short bath works at a decided disadvantage, as the dyeing results are not so satisfactory. Therefore, for an all-purpose use we lean decidedly to the proportions I have just given you. If better universal results were obtainable we would build our equipment accordingly. It is our aim to supply the trade with an all-purpose package dyeing equipment which will work flexibly and meet all requirements for all standard types of yarn packages.

I would like to stress the flexibility of our equipment in handling the different types of yarn packages, the dyeing of which is accomplished with no change in the equipment except as I have previously mentioned —that is, by using a type of material carrier designed for the specific service to be employed; with the same machinery and changing only the material carriers, it is possible to dye cops, tubes, cones, raw stock and beams all in the same machine.

Just why the American manufacturers have generally failed to take advantage of the decided increase in dyeing capacity, savings of labor, handling, etc., obtained through beam dyeing I am at a loss to understand. I have spent a great deal of time and exerted considerable effort in pointing out at various times the advantages of dyeing on the beam. For some reason I have not been able to penetrate the shell of indifference that I have encountered. Let me explain.

In our Type 1400 (850-gallon) machines, in which 525 pounds of tube dyeing may be done, we are able to dye from 900 to 1,000 pounds of yarn on beams. The difference in poundage is therefore quite evident. I hope to see, as a matter of economy, a more widespread adoption of yarn dyeing on the beam.

On my various trips to Europe, and especially in Germany, I have observed that warps are almost exclusively dyed on beams, and only the filling yarns are

dyed on tubes to be quilled from such a package to the cops. Even these filling yarns would be dyed to-day in Europe on the beam if a quiller like the Whitin cops quiller were used. In 1925 I sold to three German textile manufacturers three Whitin quillers, and when put to practical use they did not get the anticipated results. I thereupon made extensive tests at the mill of one of the best known textile plants with a Whitin quiller and found that the great number of breaks of the filling yarn in quilling the yarn from the beam nullified the advantages I had anticipated. What was the cause of this? The very poor quality of the filling yarn as spun in Germany was the only cause I was able to determine. I went further.

To prove this contention, I had shipped from America 300 pounds of spun filling yarn and encountered no trouble whatsoever with it. I ran a set of 378 cops in about twenty minutes without a single break. This proved to me conclusively the great saving in beam dyeing, and it could be advantageously employed by the German manufacturing trades if they would only adopt the Whitin quiller and overcome their yarn difficulties, and, of course, use a better yarn. I went into the matter with Ernest Fleischer, managing director of the company, and we dissected all of these difficulties on the occasion of his last visit to this country. I obtained about twenty-eight samples through the courtesy of Mr. Cottingham, general manager of the Victor-Monaghan Company, Greenville, S. C. This number of samples represented the various stages of the spinning process from start to finish. Mr. Fleischer examined these exhibits minutely and later remarked to me that the many observations he had made here in America had been responsible for many decided improvements in his spinning mill abroad. Mr. Fleischer, by the way, now buys 1-inch staple middling Texas cotton, which is a very good grade and is widely and successfully used in this country for spinning filling yarns.

Why Not More Beam Dyeing?

I am mentioning the foregoing incidents simply to stress the point I am contending; that is, the advantage of beam dyeing. And I feel that the gentlemen of your Association could be of great assistance in a little missionary work along this line, which is bound to bear economic fruit as this type of dyeing is more universally employed.

I feel the American textile manufacturers should adopt more and more the dyeing of yarns, warps, as well as filling yarns, on the beam. The saving from every standpoint is very evident, especially for large mills with large productions. Always bear in mind that the same dyeing equipment can be used and the same amount of liquor, same amount of steam and labor, and double the amount of yarns handled on beams over the same equipment dyeing the other package forms.

It has been the policy of our company to continually strive for improvement, and we have always felt that it is best to anticipate a competitor's move rather than wait until such a move had been made, and then attempt to equal or better it. Due to these aims, we have tried out and tested a great many developments, some of which were worthy to make a standard feature, others discarded. We are now building the dyeing portions of our machinery with a special nickel-bearing cast iron, which is far more enduring and productive of a better all-around grade of work. This construction will henceforth be standard with us.

We have also devised what we call our "Intermediate Dye Feeding" arrangement, which is a separate piece of apparatus, and used in conjunction with the dyeing kier and expansion tank. After thoroughly testing this device we have incorporated it as one of our standard improvement features. This consists of a cast-iron tank, motor-driven mechanical mixer, and, along with other valves, a needle-valve arrangement for injecting the properly mixed dye liquor into the circulation of our system. Its object is to perfect the dye mix before it enters the system and to feed on the dyestuff slowly. The advantages we have established through the use of this indicates that it will in all probability be copied in various forms by all of our competitors sooner or later.

I have briefly mentioned the automatic control which may be attached to our dyeing kier circulating system. With large installations this feature has a decided value, as it eliminates all the hand labor in switching the valve which directs the circulation of dye liquor through the packages in and out, and out and in.

We now recommend a separate vacuum station control for the extractors. This to accelerate the action of the extractors without interfering with the vacuum operation of our boil-off and rinsing apparatus.

We have other improvements at this time, which include the sampling device which eliminates the opening of the kier lid for testing purposes while dyeing is in progress, and are also furnishing a winch arrangement for easy opening of the dye kier cover.

Bleaching

I have made several references to our tube bleaching equipment. The operation of this apparatus is identical to the boil-off and rinse, inasmuch as the unit consists of

tank, material carriers and spindles upon which the tubes of yarn are placed. The action or flow of the bleach solution is caused by vacuum, sucking through the yarn and releasing from the expansion tank to flow by gravity back through the yarn material carrier and so into the tank. Control of this circulation is by the vacuum governor valve.

Thanks to the progressive efficiency of the chemical industry it is now possible to use peroxide of hydrogen nearly as cheaply as chlorine, and this is what I recommend. I base my recommendation upon my knowledge of how efficiently peroxide performs in our equipment. It is a more easily handled agent and eliminates the fuss and bother attendant to chlorine, and most important, produces better results. The finished product is softer, absolutely white, absorbent and possessing excellent physical properties. The bleaching formulae may be varied to obtain a softer or harder "hand." Another favorable point is the ease with which a bath of depleted strength may be brought up to standard by simply adding more peroxide without holding up the process for an instant.

You all know one of the cardinal principles of bleaching: Absolute cleanliness and the elimination of any factor which may affect either the solution or the action upon the yarn in process. We have gone deeply into the metallurgical angles and now use only "Coro" metal which is an alloy devoid of contaminating properties and highly resistant to the action of the solution to itself, possessing a high degree of stability and inertness in corrosive solutions. We have found it ideal for this service and construct our bleach tanks, material carriers, spindles and pipe of it. Thus we avoid electrolytic properties. One of the features of successful operation of our system is the elimination of almost all pumps, thus maintaining the necessary degree of cleanliness, which we could not do with pump circulation.

With a 500-pound bleach equipment we get out three batches per day, each taking three hours and thirty minutes. This includes the boil-off or scour, rinse, bleach, and final rinse; blueing may or may not be done as desired.

The equipment shown on Plate 4 of the catalogue which you have before you is now obsolete, and is superseded by that which I have just described.

This concludes my attempted verbal description of the operation of Thies equipment.

I would not like to speak of another development, which some few of you know of. That is the dyeing of rayon in package form. The rapidly increasing production and manifold uses of rayon clearly indicated a potential market for the package-dyeing of that commodity, but upon test we learned that Thies equipment, designed and adapted to cotton yarn, was a disappointment in dealing with the fiber so different in composition.

The speaker thereupon bent his efforts to the designing of equipment for rayon processing. This goes back over a period of some two years. I may now announce that after considerable experimenting I can dye packages weighing up to 1¼ pounds each or even more. My latest test machine has a batch capacity of 40 pounds, and we will build these machines in capacities of 10, 25, 50, 100 and 200 pounds.

The test dyeings have been made with yarns of 150 and 300 denier, and manufactured by such firms as Snia Viscosa, American Bemberg, Industrial Rayon, Viscose Company, and both Austrian and American Glanzstoff. I have still to do some batches of Du Pont viscose and yarn of other manufacturers, but I feel confident that the problem is solved, that is, the mechanical end of it, which is my particular interest, for, mechanically speaking, thorough penetration and evenness of color are the objectives.

This work has been carried on and developed under the auspices of a newly incorporated company which holds patents covering the system and the equipment employed. We have also developed a system for desulphurizing, bleaching and rinsing of raw rayon yarn prior to twisting. This is an equipment to be used in the manufacturing end of rayon exclusively, taking the raw yarn just as it is wound on the bobbin from the spin bath and effecting all the foregoing operations, as washing, desulphurizing and bleaching, on the original tube or bobbin upon which the said raw yarn is wound. The time consumed for all these operations is about two and a half to three hours.

We expect to reduce this time still further with an installation now being fabricated, which will shortly be tried out at the plant of one of the large viscose rayon manufacturers.

Our newly formed company has also under development other types of equipment relating to the dyeing of cotton and rayon piece goods, rayon mixtures, in the roll, and also a dyeing machine for dyeing of worsted yarns in the package forms. These subjects we hope to have the pleasure of discussing with you more conclusively at a later date.

I will be glad to give you gentlemen further information, or endeavor to answer any questions which you may care to ask. Before doing this I am handling you some dyed cotton and rayon tubes, also samples of our dyeing spindles, which are constructed of the "Coro" metal which I have mentioned.

In closing, permit me to thank you for your courteous attention, your patience and the opportunity afforded me.

Discussion on the Thies System

Chairman Knowland—I am sure we have all benefited from as well as enjoyed Mr. Steiger's very constructive paper. There must be a great many men here who would like to ask questions in reference to the methods used in handling the Thies dyeing machine.

Mr. Pollock—I should like to ask Mr. Steiger if that machine is suitable for skein silk striping and dyeing.

Mr. Steiger—Of course, we have never done that. We have never striped and dyed silk in our machine. We can dye skeins. Mr. Grandage did it himself some time ago. He can verify that. But we have never striped and dyed any silk.

Mr. Pollock—I mean silk—

Mr. Steiger—We have never tried that, but it might work. I wouldn't say that it won't work, and I wouldn't say that it will. Of course, any such new methods have to be tried before one can say, "Yes," or "No," about them, and I wouldn't say that anything can be done, unless I was sure about the result.

Mr. Pollock—Could the silk be dyed on a cone in that machine?

Mr. Steiger—I have never tried that, either. You are a little ahead of my program. (Laughter.)

Chairman Knowland—Are there any further questions?

Stewart F. Carter—I should like to ask in what form you would put filling yarns.

Mr. Steiger—I would dye them in a tube and then quill off on a universal quiller. But, of course, it would be much simpler to dye on a beam as described in my paper. I have seen this done on many occasions on the other side.

Chairman Knowland—Are there any further questions?

Mr. Hass—Is there any attempt being made to dye silk by your method?

Mr. Steiger—I have this in mind, and probably will make tests later on. I have so many things ahead of me. You know how it goes in developing new methods. If I understand you right, you mean dyeing silk in the package form, don't you?

Mr. Haas—Yes; I have never seen that done.

Mr. Steiger—No, we haven't tried it either, but I have no doubt that if you can dye rayon there shouldn't be any difficulty dyeing other fibers.

Mr. Haas—Silk, as a rule, is packed tightly, or it is in the gum, and it is pretty hard to extract the gum.

Mr. Steiger—Yes, but you have no idea what we are up against in rayon package dyeing. As soft as this package is now, you have no idea how hard it will get when it is put into water. It will get as hard as a brick, soft as it appears now. Do you want to pass that around? These paper discs (indicating) are for protection in shipping. This packaged-dyed brown tube is a combination of five different colors. If you are interested, I can give you the various colors it is dyed with. They are all, of course, direct or chlorantine colors.

Mr. Pollock—Have rayon piece goods ever been dyed on that machine?

Mr. Steiger—You are still ahead of my program. (Laughter.) But we are going to do that very shortly, I think, in about five or six weeks. Perhaps in the fall I might give you another paper on that. I am working with some manufacturing concerns on these problems now. Of course, it takes a long time to get anything made here in New York.

Mr. Pollock—We know that.

Mr. Steiger—In cotton and rayon piece goods dyeing I have prepared to automatically take care of the shrinkage. In piece goods dyeing this is a real problem. You have to take care of the shrinkage, which is usually two inches. But that is all provided for.

Here I have a piece of cloth which I brought back from Germany, or rather from Czecho-Slovakia, about three years ago. The warp is dyed in the beam and the filling on the tube. Both dyed on the Thies system.

I have here a piece of cloth which consists of about sixteen different shades. We had this woven down in the South, using the filling and warp yarn from the same tubes, dyed by the Thies system.

We also dye, if necessary, 3-inch packages on the machine, putting two of these on one spindle.

Chairman Knowland—This is a rare opportunity for us to learn something. Are there any further questions?

Mr. Donohue—May I ask Mr. Steiger if that machine must be thoroughly loaded? If one cone were missing, it would not work, would it?

Mr. Steiger—You mean if one cone, in other words, is not tight?

Mr. Donohue—Yes.

Mr. Steiger—Of course, you will get a leakage of your dye liquor at this one cone, and it won't be thoroughly penetrated. But with the arrangement we have on the spindles it is hardly possible if the men are a little careful.

Member—I think he means if one spindle is vacant, will it work?

Mr. Donohue—If one spindle should go out of order, the machine would be out of operation, would it not?

Mr. Steiger—There is hardly any possibility of it getting out of order. We have never had that happen. A nut might get a little loose but even then the penetration would be good.

Mr. Donohue—If one became loose, would that affect the dyeing?

Mr. Steiger—Not necessarily. It would, of course, affect the dyeing on the one tube, but we have never had any difficulty from that source, even if a package was a little loose.

Mr. Dougan—The speaker said he had worked ex-

tensively on rayons and had had considerable success with the various rayons. I should like to ask if Celanese has been tried.

Mr. Steiger—Not yet. You are also a little ahead of my program.

Mr. Dougan—I am quite anxious to know—

Mr. Steiger—All these different problems I have before me take up a great deal of time in solving, and therefore I have to progress step by step. However, I have arranged to ship a 40-pound rayon package dyeing machine to our dyeing plant at Belmont, N. C. I have secured the assistance of a very well-known Celanese specialist to help me out, that is, to solve the dyeing of Celanese in package form. This gentleman will make test dyeings with Celanese yarn within the next four to five weeks.

Mr. Dougan—There is a large plant near Cumberland, Md., where they are just yearning for a machine like that, if it is a success, but it has to be proved to be a success first.

Mr. Steiger—All of the tubes I am passing around were dyed in the new rayon package-dyeing machine. I can't tell you very much more about my success than you can see here. You can take off the paper disc and search into the tube and see what it looks like. The tube the gentleman has in his hand now has been rewound, consequently the outside of this particular tube or package was what used to be against the spindle. I refer only to the single tube which you have in your hand now.

Mr. Pollock—What is the advantage of your machine over the old Franklin or Obermaier machines?

Mr. Steiger—The Obermaier uses pumps with all the boiling-out and rinsing apparatus. They use pumps with every piece of machinery. We have only one vacuum pump, which takes care of all our boiling-out and rinsing tanks, continuously sucking the liquor through the packages. And in our rinsing apparatus the rinsing liquor is automatically released to the sewer. Fresh water continuously pouring into the rinsing apparatus all the while. There is another feature of our dyeing machine different from the Obermaier machine. The Obermaier doesn't have the perforated jacket. We claim to obtain by means of this jacket a more uniform pressure. Obermaier pumps from the bottom of the kier, as does the Franklin machine, thus obtaining their circulation from the outside in. The joint at the base of the Obermaier material carrier is somewhat similar in construction to ours, except that theirs is inverted, while ours is a male conical joint.

Mr. Pollock—How many different warps are in this piece—shades, I mean?

Mr. Steiger—There are four in one row and four down; 16 all told. They are all different in shade.

Mr. Pollock—All dyed on a cone?

Mr. Steiger—All dyed on a tube, like this one.

Mr. Dougan—I can't get away from the subject of Celanese. In the dyeing of most rayon yarn you are using direct dyestuffs as a rule, sodium sulphonic salts. In the dyeing of Celanese, the majority of dyestuffs now used are entirely different types. They are colloidal products and they are soluble. That is, they would call them soluble in water practically, but I should think they would present an entirely different problem . . .

Mr. Steiger—I suppose so.

Mr. Dougan— . . . because it is really a colloidal solution you are dealing with, not a pure solution.

Mr. Steiger—I think you are right on that. Of course, I couldn't give you any explanation on Celanese until we had tried it out. I am far behind as it is, right now, with the Du Pont Viscose. I will have to dye these tubes pretty soon. Otherwise I think I will get in bad with the Du Pont Company. I have so much on my shoulders now I hardly know where to turn. However, by next fall I think I will be able to tell you a little more about all of them, even about Celanese.

Mr. Benzing—Have the vats been tried on this?

Mr. Steiger—No, only direct so far. However, this class of colors is included in our program and actual dyeing with Indanthren colors will be done within the next few weeks. Nevertheless, I am told that 90% of the viscose rayon yarns are dyed in direct colors, as this is what the trade requirements seem to be at this time. So far as I know, Indanthrens have been mostly for the manufacture of shirting, that is, for the stripes and so on, but as I said before, this is also included in our future program, and we will attend to it within the next five or six weeks.

Mr. Benzing—In regard to direct dyes, you have a difference sometimes between skeins, having a light and a dark skein. Do you eliminate that somehow?

Mr. Steiger—Of course, and for the simple reason that there are about ten or twelve skeins on one tube. That is an advantage already. You never will get a lighter shade on one skein because they are all on one tube, and therefore uniform in shade dyeings. We don't have any difficulty along that line at all. I even had various tubes knitted up and they showed no streaks or anything. They were absolutely even.

Mr. Benzing—How many pounds have you dyed with this machine?

Mr. Steiger—I have dyed up to 40 pounds, and 1 to 1/14 pounds (sometimes 15 ounces, 16 ounces, or 18 ounces) on a tube. Of course, in rayon package dyeing I might add that first it is a question of winding and then, of course, the circulating of the dye liquor of the machine, and then the adding of the dyestuff. That is what I have found out. I couldn't dye rayon—I tried it

two years ago, even a year ago—in a regular piece dyeing cotton machine, so I had to change the machine almost entirely over, and then I was very successful.

Mr. Benzing—The whole thing depends upon the winding of that.

Mr. Steiger—The winding is one of the important things.

Before I started, I had about twenty-four different windings made by the Foster Machine Company and the Universal Winding, until I got the right winding. I think that even for Indanthren dyeing there must be something in the winding that is not just right yet. That is what I am working on with the Universal Winding Company at present.

Chairman Knowland—Are there any further questions?

Mr. Steiger—I have one tube rewound on about 18 or 20 quills. That is very interesting. I almost forgot about it. You can see each and every quill. They are numbered 1 to 18. I will pass that around.

Chairman Knowland—Are there any more questions? If there are no further questions you would like to ask Mr. Steiger, I might say that, as usual, the New York Section is particularly favored to-night. We are very fortunate to-night in having with us again our National President. I wonder if Dr. Killheffer won't say a few words of greeting to the New York Section. Dr. Killheffer!

Dr. Killheffer—I am always glad to be present in my own Section, but I haven't anything in particular to say, nor do I have any new stories that I can tell you.

Just recently I had the pleasure of organizing a Western Section of the Association. It started off with pretty much of a bang, and there is a promise of its being a very live section, providing they all leave their guns at home when they come to meeting.

We have been giving a good deal of thought and study to the problems of research, which I have talked to you about a number of times. Every now and then we have meetings and call in, as we did recently, people from outside of our own Association. We like to get their views and their support, and particularly financial support, which, of course, will be needed to put the things across.

Just recently one of our members wrote an article telling why he is opposed to the establishment of such a bureau as we have been planning. I am very glad to see that sort of comment. That is exactly the thing we have been trying to bring out ever since we started to talk about a research bureau. I don't mean to say that I agree with the particular views expressed in this article because, obviously, I don't, as you will find when you read the article; but what I do mean to say is that if we, as an association, tackle some problem as large as this we ought to have a very large measure of support, and support made manifest by comments pro and con from all of our membership.

The undertaking that we have discussed is, as you all know from things that have been written and said, a thing of tremendous magnitude and will take a million dollars, anyway, and we ought to have more to put it across adequately. I bespeak on the part of all of you a careful reading of any comments that appear. Nothing would please us better than to have you take up your pencils and write what your opinions happen to be. That is exactly what we would like to know.

That is about all I have on my mind. Thank you very much. (Applause.)

Chairman Knowland—Thank you, Dr. Killheffer. Before closing, I would like to suggest that we extend a rising vote of thanks to our speaker.

. . . Upon motion regularly made and seconded, a rising vote of thanks was extended to Mr. Steiger.

Applicants for Membership

Active Membership

Clasgens, Vincent P., chemist and dyer, J. & H. Clasgens Company, New Richmond, Ohio. Sponsors: A. T. Brainerd and N. A. Ruston.

Hannah, Thomas E., chemist and colorist, Pepperell Manufacturing Company, Biddeford, Me. Sponsors: R. S. Lunt and George K. Hannah.

Heritier, Louis L., tinweighter, Consolidated Piece Dye Works, Hazel Street, Clifton, N. J. Sponsors: Louis Larrat and Paul Chasse.

Loescher, Oscar P., hosiery dyer, Cooper, Wells & Co., St. Joseph, Mich. Sponsors: Charles E. Maher and F. H. Proudfoot.

Loughlin, K. C., student, North Carolina State College Textile School, Box 5394, West Raleigh, N. C. Sponsors: A. H. Grimshaw and James W. Black.

Pickup, Thomas W., color mixer, Hartsville Print & Dye Works, Hartsville, S. C. Sponsors: Thomas J. Nuckolls and D. S. Moss.

Ray, Delbert E., overseer of dyeing, Massachusetts Mohair Plush Company, 34 West Forrest Street, Lowell, Mass. Sponsors: Robert E. Murphy and Fred Riley.

Rollins, Henry E., superintendent of dyeing, Clifton Yarn Mili, Conshohocken, Pa. Sponsors: Charles A. Seibert and Harry G. Fish.

Schmeibert, Raymond H., salesman-demonstrator, Geigy Company, Inc., 89 Barclay Street, New York, N. Y. Sponsors: Daniel P. Knowland and S. Walter Slough.

Stronach, Irving N., dyer, Hampton Company, Easthampton, Mass. Sponsors: Geo. O. Linberg and Philip H. Stott.

Thorpe, Hugh M., assistant dyer, Real Silk Hosiery Mills, Indianapolis, Ind. Sponsors: Carl E. Bick and Meyer Fleischmann.

Junior Membership

Glickman, Bernhardt B., dyer, the Ziskind Company, 711 East 140th Street, New York, N. Y. Sponsors: Louis S. Zisman and L. J. Dogin.

Changes of Address

Ambler, Harry, 65 Chandler Street, Pawtucket, R. I.
Apsey, George Willis, 272 Lafayette Ave., Passaic, N. J.
Archer, B. K., 111 Arch Street, Philadelphia, Pa.
Baker, Abel W., R. F. D. 2, Elizabeth, N. J.
Brosnan, Wm. F., care of Antipyros Company, 551 W. Fifty-second Street, New York, N. Y.
Davenport, H. G., 25 Fountain Street, Room 10, Providence, R. I.
Donaldson, Edwin R., 3810 Kansas Avenue, N. W., Washington, D. C.
Dougan, Paul R., P. O. Box 165, South Manchester, Conn.
Ferguson, Duncan, 57 Pleasant Avenue, Passaic, N. J.
Green, L. E., 232 West First Street, Chattanooga, Tenn.
Heintz, Wallace P., 12-A Sterling St., Somerville, Mass.
Innes, Archie K., 23 Beech Street, Franklin, N. H.
Johnson M. T., Box 694, La Grange, Ga.
Mease, Arch J., 1676 Taylor Avenue, Utica, N. Y.
Meeker, Samuel, Arlington Apts., Hawthorne, N. J.
Milnes, Charles I., 70 Ralph Street, Providence, R. I.
Pickens, W. I., care of E. I. du Pont de Nemours & Co., 232 West First Street, Charlotte, N. C.
Prisley, Frederic A., 66 Hazard Avenue, Providence, R. I.
Robertson, J. D., P. O. Box 32, North Dighton, Mass.
Schoedler, Dr. Ulrich, care of Grand Union Hotel, 34 East Thirty-second Street, New York, N. Y.
Scheuer, Edwin, Gunter Hotel, San Antonio, Tex.
Schoffstall, Charles W., 821 Forest Avenue, Evanston, Ill.
Scott, Lester C., 1745 Caton Avenue, Brooklyn, N. Y.
Siever, Hughes L., Selwyn Hotel, Charlotte, N. C.
Smith, Douglas W., 16 Howe Street, Greenville, S. C.
Travis, Herbert S., 1653 Harrison Street, Frankford, Philadelphia, Pa.
Ulmes, August, 8909 Eighty-fifth Road, Woodhaven, L. I., N. Y.
Ward, George C., 12½ Waverly Terrace, Cumberland, Md.
Webb, R. H., Concord, N. C.
Worton, James, Washington Avenue, Pottersville, Mass.
Zinck, Warren J., 9 W. Church St., Penns Grove, N. J

ASSOCIATION BADGES

The lapel button badge illustrated herewith is worn by members of the American Association of Textile Chemists and Colorists.

The three "rings" are enameled in red, yellow and blue, respectively, and the initials and border are brought out in gold. The general effect is exceedingly attractive.

Badges may be secured at $1.50 each by addressing the Secretary.

ALEX MORRISON,
American Woolen Co.,
Andover, Mass.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Directing Editor

CLAYTON HOAGLAND
Managing Editor

MYRON DREW REESER
Advertising Manager

Published biweekly by
HOWES PUBLISHING CO., INC.
90 William Street, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year; Canadian $5.50; foreign $6.00

Vol. XVIII May 13, 1929 No. 8

THE GRECIAN HORSE

"A few days ago a Grecian horse came to town labeled 'The American I. G.' In it were the same old crowd, Karl Bosch, Ludwigshafen, Leverkusen—the German I. G. . . . that horse has been brought here for the purpose of cutting the throat of our chemical independence, our safety in national defense, and the protection and health of our children . . . to destroy the progress we have made. . . ."

WHEN Francis P. Garvan uttered this opinion in the course of his address before the American Institute of Chemists, at the dinner recently given in his honor, there may have been a few skeptics in his audience. To these his words would sound pessimistic and his fear would seem uncalled for. But if there were any skeptics who reacted in this way they were either too young to recall the era when America lived under the shadow of a German chemical monopoly or else their memories were very short. For Mr. Garvan meant every word of what he said, because he knows what is inside the Grecian horse and he knows from past experience what to expect now that the horse has entered our country.

"Always and forever, remember the stake for which the Germans strove before the war and in the war and since the war," said Mr. Garvan, ". . . world power through monopoly of science. But the battle will be taken up and fought over again and that Grecian horse will be driven out of the country!"

It is not yet known how Mr. Garvan and the Chemical Foundation propose to destroy the alliance of American capital and foreign industry which was formed last month with the creation of the American I. G. Chemical Corporation. But we can at least realize some of the difficulties that will be encountered in this fight. This Grecian horse is not a colt, but a great, muscular truck-horse; and it may not only be strong but of an arrogant temper.

The bare facts about the American I. G. are now generally known. Financed by the National City Bank to the tune of $30,000,000, the new corporation will combine the resources of the Standard Oil of New Jersey, the Ford Motor Company and the German dye trust; all of these interests are represented on the board of directors, and its assets are estimated at $60,000,000. The 5½% debentures of the corporation were oversubscribed on the day they were offered in the market. Walter C. Teagle, of the Standard Oil, has declared that his company has no financial interest in the enterprise; but a research agreement made between the Standard Oil and the I. G. in 1927 is still in force.

There is considerable secrecy about the course of action which this American-German trust will follow, and one man's guess is no better than another's. We cannot know whether the American I. G. will give most of its attention to research and manufacture in the chemistry of oils, gasoline and synthetic rubber, or on the other hand, to the marketing, in the United States, of German rayon, fertilizer and dyestuffs. From the make-up of the directing board it would seem on the surface that the activities of the group will most likely be centered on oils, rubber and gasoline. And this conclusion will no doubt console a few short-sighted dye manufacturers in our industry; but the wiser men in the American dye and chemical industry realize that their business is seriously in danger despite the new corporation's interest in products other than dyes.

We may get some idea of how formidable this A. I. G. may become if we recall some of the pacts and agreements made in the past few years between the German dye trust and various American interests. In 1924 a dyestuff-production pact was signed with an American company; a patent and process pool covering hydrogenation and oil cracking was effected with another American corporation in 1927; an explosives pool with another, along with the British Nobel company; joint production with American rayon producers controlled by British Courtaulds; licensor rights on activated carbon; a 50 per cent interest in a plant being erected in New York State for production of photo-chemicals and materials; an agreement on sales of I. G. synthetic perfumes in the United States. The dye trust also concluded deals last year with British, French, Swiss and Italian chemical factors. It acquired 200,000 shares of British Breda Silk, Ltd. The I. G. also owns about 25 per cent of I. G. Dyestuffs of Manchester, England, and according to a Government report on German Chemical Developments, an agreement may yet be effected between the I. G. and the big British trust, Imperial Chemical Industries, Ltd.

From this review of the I. G.'s recent affiliations it should be evident that there is much more in the bowels of the Grecian horse than appears on the surface. It is a very powerful line-up of foreign industrial units, and through the timely support of American money and research it has been rendered more powerful. The formation of the American I. G. means that the German chem-

ical trust will have access to the results of our research in oil and gas chemistry and other basic processes. One report asserts that a synthetic nitrogen plant will be erected in the United States by the Standard Oil and operated with the I. G., and that a German rayon plant will also be established here.

Now, the ostensible purpose of the new trust *may* be organized research in rubber and oils. But what will prevent the American I. G. from putting its foot firmly into the door of our domestic dye and chemical markets? Supported as it is by a stack of American money, what is to prevent this trust from underselling our own dye manufacturers and our rayon manufacturers and recouping any losses through its profits on synthetic nitrogen, oils and metals?

The dangers to American industrial independence that lurk behind such a chemical trust as the A. I. G. are many. If it were a foreign sugar trust or a steel combine, or any more specialized venture, there would be less cause for alarm. But because it is essentially a *chemical* corporation, the new trust can attack our most vital interests on many fronts. The relation of chemistry and chemical manufacturing to national defense and to every major industry in this country and to our future progress in many branches of science need not be emphasized here, so familiar are the readers of the REPORTER with this aspect of the situation.

To quote from a comment by Hugh Farrell, author of "What Price Progress?": "The threat in this newest maneuver of the I. G. lies in the danger that research in this important field is once more in danger of gradually being left exclusively to the Germans. . . . In our country, apparently, business is business. In Germany the business of industrial leaders is the economic welfare of their country. The dollar in the hand means nothing to the Germans; they are looking to the future. . . ."

The American dye industry and the cause of American science, and the cause of our national defense have been betrayed by our unpatriotic bankers; for without adequate financing, the formation of an A. I. G. would be unlikely. How much wiser would our bankers have been had they offered their services in the creation of a stronger American chemical industry. Must we believe that Germany has a monopoly of foresight?

WHY NOT SHOW THE PUBLIC?

THE Twelfth Exposition of Chemical Industries has come and gone. A spectacular show, it drew thousands of visitors from all over the United States and abroad to the Grand Central Palace in New York every day last week. The Exposition occupied three expansive floors in the Palace. Chemical engineering machinery and equipment again held the center of the stage.

Any readers of the REPORTER who visited this exposition in the hope of seeing on display some striking evidence of progress in textile chemistry and dyeing and dye manufacturing were probably disappointed. There might have been some evidence of this kind at the Chemical Show, but it would have taken a Sherlock Holmes to have found it. None of the larger dye manufacturers exhibited. The display that approached nearest to an educational exhibit of progress in the textile industry was a demonstration of rayon manufacture.

Those branches of our great chemical industry which serve the textile mills with chemicals and colors apparently do not believe it worth while to show the public what America has achieved in the field of fast dyes. This attitude is regrettable. At no time in the past has the need been greater than it is to-day for some good healthy propaganda for American dyes, to convince more people in this country that we can and do make the fastest types of dyes and that wherever the public is troubled with inferior dyes in its apparel the fault lies with the mills that use cheap colors.

The Chemical Exposition offers a fine opportunity to prove this point. One large display staged with the co-operation of all the leading American dye manufacturers would help to do the trick, and with a little ingenuity it could be made one of the most exciting features of the whole show.

AMERICANISM A LA HEARST

HOW can a newspaper have the nerve to use the name *American* after it has descended to the baseness of this:

> Charles E. Mitchell, Edsel Ford, Walter F. Teagle have gone into the dye industry in partnership with the Farbenindustrie Aktiengesell-schaft, which is the great German dye trust.
>
> Chemical skill and experience of the Germans combined in an American company, with the industrial energy and financial resources of those named above, should get results. Light will come to certain individuals who thought they could create an industry by seizing German property and patents in war time.

Arthur Brisbane wrote that sample of Hearstly patriotism in his daily column in the New York *American* of April 28. As the mouthpiece of William Randolph Hearst what else could we expect him to write? If Mr. Brisbane really believes what he wrote he is grossly misinformed. But his belief in the matter is unimportant. The evil consequence is that several thousand of his readers will believe it because they know no better.

Hearst papers in several sections of the country print Brisbane's column on the front page every day, and among the thousands reading it there are very likely not more than a handful of people who know the *facts* about the creation of the American dye industry.

Most readers of Hearst papers are not the type who would be fully informed on the truth about the Chemical Foundation. How many readers of the *American*, we wonder, studied all the testimony submitted during the trials of the Government's suit against the Foundation? How many of these readers are well informed on the decisions handed down in every court in which this case was tried—decisions which gave an unconditional victory to the Chemical Foundation in the United States Supreme Court and in every lower court that heard the case; decisions which also rebuked severely the United States Department of Justice for its affront in bringing the Foundation to trial? How many of those readers know, on the evidence of these decisions, that the so-called "seizing" of German patents was entirely vindicated, not alone as an act absolutely legal from every standpoint, but also as an act fully justified and undeniably ethical under the conditions which prevailed when it was accomplished?

Arthur Brisbane and Mr. Hearst are fully aware of these facts; and they know, as well as President Wilson knew and as every American dye manufacturer knows, what conditions prevailed before we had a dye industry. But how many of those who read Mr. Brisbane's despicable piece of slander realize that if it had not been for the courage and foresight of the men who created an American dye industry twelve years ago, the United States might now be left far behind the European powers in industrial progress, in scientific achievement and in resources for our national defense?

POPPY DAY

EACH year the Veterans of Foreign Wars conduct their Buddy Poppy Sale simultaneously throughout the entire country during the week of Memorial Day to raise funds for the adequate maintenance of their relief activities.

Each genuine Buddy Poppy carries a copyright green label which identifies it as the genuine handiwork of disabled and needy ex-service men. The majority are made in government hospitals through an arrangement with the United States Veterans Bureau. In two hospitals alone, Hospital No. 81 in New York City and Hospital No. 108 in Northport, Long Island, approximately 2,000,000 are being made, and the poppy-making gives employment to patients through the greater part of the year. A national total of 6,000,000 Buddy Poppies will be completed in readiness for the opening of the sale.

The indorsement of the President of the United States has been extended to the sale each year since its inception eight years ago. Other indorsements of national significance include the General Federation of Women's Clubs and State federations; William Green, president of the American Federation of Labor; fraternal organizations; religious leaders; business and professional organizations of outstanding prominence.

THAT NAME AGAIN

The need for the general adoption of the word rayon rather than artificial silk is exemplified by the exhibition of imitation fur fabrics. At once it is seen that "rayon fur" is a manageable description, whereas "artificial silk fur" sounds very much like nonsense.

As rayon develops and new possibilities are disclosed, the word "artificial" will become more and more an anachronism, and might quite easily become a hindrance to business. Certainly the exhibition indicates that new types of rayon cloth must be expected from time to time, and plenty of them. Even the most enthusiastic rayon "fan" would hesitate to predict its achievements during the next ten years.—*Textile Weekly, Manchester, Eng.*

WILLIAM T. POWERS REPRESENTS TOLHURST IN NEW YORK

It has been announced by the Tolhurst Machine Works, Troy, N. Y., that their New York office has been moved to the Hudson Terminal Building, 30 Church Street. Concomitant with this move it is announced that William T. Powers will assume direction of the new office.

Mr. Powers has served as service engineer in the New England and the Mid-Western territories. He has had wide experience in the application of centrifugal machinery to the process industries, combined with a thorough knowledge of both product and process problems.

COX, FULLER & MAUERSBERGER

James W. Cox, Jr., announced last week as of May 1 his business of consulting textile engineer and specialist will be taken over and continued with the same policies as for the past ten years by a partnership composed of James W. Cox, Jr., George Fuller and H. R. Mauersberger.

The enlarged organization, said the announcement, will permit a more comprehensive service to the textile trade on technical problems in mill, laboratory and development work.

LOWELL TEXTILE INSTITUTE ALUMNI REUNION

The Lowell Textile Institute Alumni Association will hold its thirtieth annual reunion at the Lowell Textile Institute, Lowell, Mass., on Saturday, May 18. A program has been arranged for the entire day, which includes a buffet luncheon, a banquet, a round-table discussion and outdoor sports. Tickets for reservations are obtainable from Arthur A. Stewart, secretary-treasurer of the association, at $4 each. Committees, namely, nominating, technical, games and speakers and banquet, have been appointed to supervise the respective features.

The Dyer's School of Experience

[EDITOR'S NOTE.—*The following narrative is one of a series being published under the general head of "The Dyer's School of Experience." Realizing that the genuine material for such a series is to be found largely among its own readers, The* REPORTER *solicits contributions from that source and will pay for those accepted at regular space rates. Among the readers of this journal there should be many who have, in the course of their experience as dyers or chemists, encountered incidents which should prove most interesting and helpful to their fellows. Send all manuscripts to* AMERICAN DYESTUFF REPORTER, *90 William Street, New York City.*]

WHEN GERMANY'S DYESTUFFS STOPPED COMING

By NOEL D. WHITE
Davenport Hosiery Mills, Chattanooga, Tenn.

SOME time ago I read in this column some experiences by my friend and colleague J. V. Sheffield which I enjoyed reading very much. They were true to life. They reminded me of some other dyers I knew who acted the same way as the one he mentioned—always suspicious; always thinking someone was trying to spoil their work. Good for you, Brother Sheffield, and quite welcome. Come again.

I thought it would be quite interesting to relate, in compliance with his request, how we did our work twenty years ago, or maybe thirty or forty years ago, when we had very few dyes to work with and most of the dyes were prepared by the dyer himself. This time, however, I will mention some of the experiences I had during the days when the World War started and the dyers had to find their way out or close the shops.

ORDERING A SIX MONTHS' SUPPLY

During the hectic days in the summer of the year 1914, when German dyes stopped coming into the country and the dyers were at a loss to know where to get the next supply of dyes to keep their works going, many of us had to rake our brains to devise means to carry on. Some of the older dyers remembered yet how to dye with roots, woods, flies and minerals, and dug out the old formulas; but that idea also proved a wash-out, for those natural dyes had to be procured mostly from distant lands, and navigation was extremely precarious and could not be relied on. Not many knew how to dye with the old methods, and hence found the scheme impractical.

In the case of the writer, although he knew some of the principles of the ancient way of dyeing, he was now engaged in a line that demanded bright and fast colors, and the recipes that he had in his little old book proved utterly inadequate.

He had received orders as soon as the threatening calamity became apparent to order a supply of all needed dyestuffs to last for at least six months: but when the orders were sent in to the respective dealers in dyestuffs they were filled only in so far as the dealers were able to fill them, and a notice was sent us to the effect that the balance would be delivered as soon as they received another shipment from abroad; which promise, I must say, was kept later by one firm, the Bayer Company, when the submarine Deutschland succeeded in running the blockade and crossed the Atlantic with a cargo of dyestuff that proved to be little better than a drop in the bucket.

THE PRE-WAR STUFF

The production of dyestuffs from the beginning had been very prolific in number. Several factories were engaged in it and great competition existed between those factories.

As soon as one dye was put on the market another was devised better and cheaper. The dyer had no sooner learned to use one and stocked up on it than he found that he could do better work with another, and in some cases it would pay him to disregard his provision on hand and put in the new and cheaper one. In consequence, many cans, kegs and even barrels of dyestuffs foud their way in some corner of the stockroom or in some out-of-the-way place, to be forgotten.

A new dyer entering a factory would discard the dyes of his predecessor and use dyes he was acquainted with. Of course, that is done even to-day, but not to the extent of the olden time, when dyestuffs were so cheap that in some cases it did not pay even to store them when room was needed for other things.

When I took the position where I happened to be when the war began, my first thought was to dump the supply I found into the river, it was so bad, in my opinion; but I finally persuaded the superintendent to board up a corner in the attic and filled it up with the old colors, thinking I would be able to use them a little at a time. As it happened, some were used, but most of it was finally sold at a very big profit to other mills when the visible supply had vanished.

THE SCRAMBLE FOR DYESTUFFS

When the supply of dyestuffs from dealers was finally exhausted, many dyers thought of the old forgotten dyes stored away, and started digging them out and pressing them into service. In cases where the old dyer was still on the job he made good use of them, but in those mills where a new man was doing the work he was faced with an unfamiliar lot of dyes

he did not know how to use. Chemists and dyestuff experts were called in to classify them and find out how to use them to best advantage, and it was found that some mills could use some of the stock found elsewhere, and vice versa, and a kind of exchange was started. If it had been kept among dyes and chemists and the exchange had been strictly between them it would have been all right; but it soon got out, and brokers, schemers and not very scrupulous speculators took the matter in hand and saw in it a chance to make a lot of money quickly and easily without any great outlay of capital. They would go to a mill, obtain a list of their discarded colors on hand and also a list of their needs, and from the list of one supply the need of another. They issued weekly bulletins offering samples of what dyes they had, also asking what dyes the mill wished to dispose of.

That would have been above criticism; but it did not stop at legitimate exchange.

They would take a dye from one mill, swell it up with sand, salt or anything that would mix with that particular dye, raise the price three or four or more times, then offer it to any in need of it as the genuine stuff and gouge out of the man that needed that particular dye all he would stand for. Some of these dyes that were offered to me were so heavily adulterated as to be rendered absolutely worthless.

I am glad to state that, of course, none of the legitimate dealers in dyestuffs stooped to any such scandalous practice. My suppliers were always on the look-out for some dyes they knew I could use, and promptly sent me a sample to test out. One day I received a sample of Victoria Blue with a letter stating there were 100 pounds to be had at $3 a pound, but I would have to act at once. It was on Saturday morning. I tested that Victoria Blue and found it excellent any way I tried it. As soon as I was convinced it was a good buy even at that price I went to the office to telephone my acceptance, but I found that the manager had left and the bookkeeper absolutely refused to place the order. I was frantic. Afraid to lose that Victoria Blue that I needed so badly, I let loose my opinion of him in no uncertain words, then took the first train to Boston to nail that keg of Victoria Blue on the spot.

I had it shipped to my own home. A few days after, when my supply of blue in the dyehouse had run out, I told the manager there had to be some blue bought or some shades would become a thing of the past. He said he would find some. He kept the wires hot for two hours and ran up a sizable telephone bill, then reported that he could get about 10 pounds from a shark, subject to my approval, at $6.50 a pound. When it arrived it proved to be the worst concoction ever sold for Victoria Blue. Then I told him about the lot that the bookkeeper had refused to take the responsibility of ordering on my advice. I told him I could get it in half an hour. He never asked the price. That night I laid awake all night figuring how much I should make on that transaction. If he was willing to pay $6.50 for what that shark wanted to sell us, this Victoria Blue was surely worth $10 or more. The next morning I gave him the bill as received by the dealer, saying I could have made $700 on that, but my conscience would not let me.

The bookkeeper was told to go join the Army and was never taken back.

Hunting for Discarded Dyes

As the mill had salesmen to spare at that time, I suggested one should be sent out among our friendly mills on the hunt for discarded dyestuffs we could use. He was instructed to send a sample of every dye he found for me to test for usefulness and value. In no time I had received more samples than I could find time to test accurately, and had to hire a demonstrator from the army of laboratory workers that were thrown out of work. He would test dyes under my instructions as to what he should look for in the samples we received daily. In that way we made sure that no good dyes that should come our way should be overlooked and lost. The quantity of dyestuffs found in the country was a revelation. As many more, I am sure, were doing the same thing under different conditions for lucrative and dishonest purposes, it is no wonder that some made large amounts of money for a time.

What we were looking for primarily were green crystal, Victoria Blue, Primuline, and Diazo Red and Chrysophenine, or some similar yellow. This last was the hardest to find. One day our salesmen sent in two samples of the last named, saying he had found 700 pounds of it at $7.50 a pound and could get all of it if I wanted it. Our trials brought out the fact that while it was a good color—what there was of it—it had been mixed with so much salt that it took 20 pounds when three were needed of the usual Chrysophenine we bought. I promptly replied that it was not wanted. He had picked up some Milling Yellow for me and we could wait until something better was found.

Temptation

That evening, when about to retire, someone rapped at my door. A young man wanted to see me. He asked if I was the dyer at the mill, introduced himself, and offered me two tickets for the Textile Exhibition that was to open the following week in Boston. I asked him to what I owed the pleasure of his visit.

"Did you receive two samples of Chrysophenine last week?" he asked.

"I did; tested them and found them valueless."

"What was wrong with it?"

"It had no tinctorial value; too much salt in it."

"I knew it was weak," he said. "But outside of that

it was good stuff. You would have to use more of it. I have 700 pounds of it. Could you buy it all?"

"I would have to use 20% instead of 3%; that would make my dyeing too expensive at the price."

"Could you use it as it is?"

"Under the circumstances I could, if it were cheap enough."

He pulled a notebook out of his pocket, wrote something on it, and then said: "If you take it off my hands this is what I do," and showed me what he had written: "Twenty per cent for you"!

Vade Retro Satan

That left me speechless. Didn't know whether to feel insulted, to laugh in his face, or to throw him out of my house. A look at him (he looked like Jack Dempsey) convinced me I had better be careful; no violent actions. I mentally figured what that meant to me—in round figures, over $1,000. The previous Saturday I had gone to Nantasket Beach to rent a cottage to send my family away for the summer, and had a chance to buy a very valuable lot for just that amount from a man who wanted to raise some money, and here was a chance to make it without any effort, making a friend in the bargain by doing him a good turn. Then it occurred to me that this fellow was just an unscrupulous profiteer who had spoiled a lot of otherwise excellent dyestuff at a time it was most needed. If I could not, on account of my size, resent the insult and punch him on the nose, I could order him out of my house; so I deliberately arose, went to the door, and, opening it, I said: "It shall never be said that I have been a party to any such deal."

Some Good Dyes Arrive

Some time after, a supply of Chrysophenine was shipped to us in the original strength from the Deutschland cargo. That was three times the strength we were used to getting. Some dyestuff! One per cent was used in place of the usual three per cent. Of course, we had to pay three times the current price, but it was worth it.

That emphasized the greediness of those unscrupulous meddlers in dyestuffs; but that supply did not last long. A second submarine started, but went to the bottom and never reached these shores, and in the meantime nearly all the best of our discarded dyes had been used up, but by now some colors had been produced by our own dye plants.

The first of our domestic dyes that came to my attention was a keg of Primuline. I had to laugh the first time I tried to dissolve some of it. We had made a test, dyeing a small skein in a beaker, and found it satisfactory; but when we poured hot water over 8 pounds of it in a kettle in the usual way, it started to foam and rise, and in no time it had overflowed the kettle and gone out. Maybe some dye maker could tell me what caused that. I learned to dissolve it by wetting it with warm water first and then boiling it gradually. I did not complain and did not care for the loss, for we were now assured we could have all we wanted.

Other dyes gradually were produced. From Du Pont, Victoria Blue of the very best; from the National, browns that had to be chromed but were the fastest we ever had; from Newport, Primuline that did not overflow in boiling water; Chrysophenine from several sources for the asking. W heaved a sigh of relief. Our troubles were now over. Three cheers for our chemists and dyestuff makers!

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i. e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

DYESTUFF SALESMAN

Old established manufacturer of dyestuffs and chemical specialties has an opening for a salesman for New York State and eastern New Jersey. Salary and commission. Good opportunity for the right man. State full particulars. Address: Classified Box 525, American Dyestuff Reporter.

SALES EXECUTIVE

Handled complete line heavy chemicals, textile finishes fourteen years for one firm; department superintendent in large shade-cloth mills; three years president and sales-manager of active plant; general acquaintance with manufacture and application of chrome colors, paint base, bleaching, finishing and filling of muslin. Prefers chance to build up small mill, New England, with interest in business and moderate salary. Address: Classified Box 526, American Dyestuff Reporter.

PACIFIC DYESTUFF SALESMAN

Position wanted by dyestuff salesman; several years' experience visiting all classes Pacific Coast trade. Capable, well acquainted; knows colors and requirements of consumers. Address: Classified Box 517, American Dyestuff Reporter.

REAL OPPORTUNITY

Established dyestuff and chemical concern wishing to expand will give interest in business to live salesman with following. Minimum of $2,000 investment required. Address Classified Box 527, American Dyestuff Reporter.